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## ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51D) LAUNCH

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## TECHNICAL MEMORANDUM

### ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51D) LAUNCH

#### I. INTRODUCTION

This report presents an evaluation of the atmospheric environmental data taken during the launch of the Space Shuttle/STS-51D vehicle. This Space Shuttle Vehicle was launched from Pad 39A at Kennedy Space Center (KSC), Florida, on a bearing of 91.6 deg east of north at 1359 UT (0859 EST) on April 12, 1985.

This report presents a summary of the atmospheric environment at launch time (L+0) of the STS-51D, together with the sequence of prelaunch Jimsphere measured winds aloft profiles from L-13 hr through liftoff. The general atmospheric situation for the launch and flight area is described, and surface and upper level wind/thermodynamic observations near launch time are given. Since the ship Redstone was unavailable for STS-51D duty, the SRB descent/impact atmospheric data were not taken. However, one can use the STS-51D ascent data for SRB studies, as the best substitute.

Previous MSFC-related launch vehicle atmospheric environmental conditions have been published as Appendix A of individual MSFC Saturn Flight Evaluation Working Group reports [1]. Office memorandums have been issued for previous flights giving launch pad wind information. A report has also been published [2] which summarizes most launch atmospheric conditions observed for the past 155 MSFC/ABMA-related vehicle launches through SA-208 (Skylab 4). Reports summarizing ASTP, STS-1 through STS-51C launch conditions are presented in References 3 through 18, respectively. Table 1 gives the atmospheric L+0 launch conditions for all Space Shuttle missions.

#### II. SOURCES OF DATA

Atmospheric observational data used in this report were taken from synoptic maps made by the National Weather Service, plus all available surface observations and measurements from around the launch area. Upper air observations were taken from balloon-released instruments sent aloft from Cape Canaveral Air Force Station (CCAFS). High-altitude winds and thermodynamic data were measured by the Super-Loki rocketsondes launched from the CCAFS. Table 2 presents a listing of systems used to obtain the upper level wind profiles used in compiling the final ascent atmospheric data tape. Data cutoff altitudes are also given in Table 2.

#### III. GENERAL SYNOPTIC SITUATION AT LAUNCH TIME

A low pressure system was developing over the Gulf of Mexico, west of Florida, during the countdown and launch of STS-51D. Scattered light rain fell over central and southern Florida prior to the launch of STS-51D. Figure 1 depicts the surface map conditions 1 hr 59 min before launch. The shaded region of Figure 1 indicates areas of

precipitation. Southwesterly winds dominated the flow aloft over the KSC Florida area. Figure 2 presents the winds aloft conditions at the 500 mb level 1 hr 59 min prior to launch.

Overcast skies were the rule over the Cape Canaveral area prior to liftoff. Figure 3 shows the GOES-6 visible picture at 1400 UT (1 min after liftoff) with 500 mb contours and wind barbs superimposed. Figure 4 presents an up-close visible picture of the Florida peninsula as recorded by GOES-6, taken also at 1400 UT.

#### IV. SURFACE OBSERVATIONS AT LAUNCH TIME

Surface observations at launch time for selected KSC locations are given in Table 3. Included are pad 39A, shuttle runway, and CCAFS balloon release station observations. Neither precipitation nor lightning was observed at launch time.

Table 4 presents Pad 39A wind data along with other standard hourly atmospheric measurements and sky observations for the 6-hr period prior to launch of STS-51D. Values for wind speed and direction are given for the 84 m (275 ft) FSS reference level and 18 m (60 ft) pad light pole level.

#### V. UPPER AIR MEASUREMENTS DURING LAUNCH

The FPS-16 Jimsphere (1446 UT), MSS Rawinsonde (1402 UT), and Super-Loki Rocketsonde (1600 UT) systems were used to measure the upper level wind and thermodynamic parameters for STS-51D launch. At altitudes above the rocket-measured data, the Global Reference Atmosphere (GRA) [19] parameters for April KSC conditions were used. A tabulation of the STS-51D final atmospheric data for ascent is presented in Table 5 which lists the wind and thermodynamic parameters versus altitude. A brief summary of parameters is given in the following paragraphs.

##### A. Wind Speed

At launch time, wind speeds were 19.9 ft/sec (11.8 kn) at 60 ft and increased to a maximum of 134 ft/sec (79 kn) flowing from 265 deg. This maximum occurred at an altitude of 42,600 ft (12,984 m). The winds decreased above this level as shown in Figure 5. The overall maximum measured speed was 134 ft/sec (79 kn) at 42,600 ft (12,984 m) altitude.

##### B. Wind Direction

At launch time, the 60-ft wind direction was from the east (082 deg) and shifted to a southeasterly component by 5500 ft (1676 m). Winds returned to an easterly component at 7500 ft (2286 m) and kept this easterly component through 11,500 ft (3505 m). Above this level winds shifted through south and around the 30,500 ft (9296 m) altitude they established themselves with a westerly component. The winds kept this westerly component up through 199,000 ft (60,655 m) with minor oscillations occurring in direction whenever wind speeds became light. Model atmosphere results produced a southeasterly component near 280,000 ft (85,344 m), with westerly flow dominating up to 400,000 ft (121,920 m).



### C. Prelaunch/Launch Wind Profiles

Prelaunch/launch wind profiles presented in Figures 6 through 9 were measured by the Jimsphere FPS-16 system for the launch at 1259 UT, April 12, 1985. Data are shown for four measurement periods beginning at L-13 hr and extending through L+0.

The wind speed and direction profiles for the 13 hr period prior to and including launch are shown in Figures 6 and 7. The in-plane (head-tail wind) and out-of-plane (left-right crosswind) profiles are given on Figures 8 and 9. The wind speeds and associated component values did not differ significantly from the April means, however, extreme shears in the 30,000 ft to 50,000 ft altitude layer at critical Mach numbers did cause an exceedance in the calculated ascent loads during the L-13 hr simulation. It amounted to being 1.4 percent over the design limit for the L20 wing location. The L-13 hr Jimsphere release also indicated the presence of jet stream winds over KSC, which had previously remained over the southern portions of Florida. However, the subsequent profiles for L-7.25 and L-3.5 hr indicated lessening loads, all within design limits. The prelaunch atmospheric conditions are discussed in more detail in Section III.

### D. Thermodynamic Data

The thermodynamic data taken at STS-51D launch time, consisting of atmospheric temperature, dew-point temperature, pressure, and density have been compiled as the STS-51D ascent atmospheric data and are presented in Table 5. The vertical structure of temperature ( $T$ ) and dew-point temperature ( $T_d$ ) for the STS-51D ascent are shown graphically versus altitude in Figure 10.

The atmospheric thermodynamic parameters of temperature, pressure, and density, measured during STS-51D launch below 70,000 ft were all within 4 percent of their respective PRA-63 [20] annual values. All these parameters stayed within 7 percent of their respective PRA-63 values, at all levels of measurement.

### E. SRB Upper Air and Surface Measurements

As has been mentioned in the introduction, since there was no ship available, an SRE descent atmospheric data tape has not been constructed. The tabular values for the ascent atmospheric tape as presented in Table 5 should be used for SRB descent/impact studies since it is the closest measured data source.

**TABLE 1. SELECTED ATMOSPHERIC OBSERVATIONS FOR THE FLIGHT TESTS OF THE SPACE SHUTTLE VEHICLES**

Vehicle Data <sup>h</sup>			Surface Observations					Inflight Conditions Max. Wind Below 60,000 ft			Count Down and Launch Comments of Meteorological Significance	
			Thermodynamic <sup>a</sup>			Wind <sup>b</sup>						
			Seq. No.	Vehicle No.	Launch Date	Time (EST) Nearest Minute	Press. <sup>c</sup> N/cm <sup>2</sup>	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)		Dir. (deg)
1	STS-1 Columbia	4/12/81	0700	10.234 <sup>d</sup>	21	82	11.8 15.2	125 120	44,300	98	250	Wind directional change observed at Pad just prior to L+0. Onset of sea breeze.
2	STS-2 Columbia	11/12/81	1010	10.166	23	61	27.0 27.0	345 355	36,300	158	286	
3	STS-3 Columbia	3/22/82	1100	10.160	24	71	7.0 <sup>e</sup> 8.0 <sup>e</sup>	50 <sup>e</sup> 145 <sup>e</sup>	45,000	119	250	
4	STS-4 Columbia	6/27/82	1100 <sup>f</sup>	10.200	29	70	5.8 <sup>g</sup> 4.9 <sup>g</sup>	133 <sup>g</sup> 141 <sup>g</sup>	47,900	37	329	17 min countdown delay due to adverse weather conditions. Thunderstorms in area.
5	STS-5 Columbia	11/11/82	0719	10.227	22	68	22.0 35.0	90 90	40,600	146	336	
6	STS-6 Challenger	4/4/83	1330	10.183	23	55	12.7 16.4	63 55	46,100	155	277	
7	STS-7 Challenger	6/18/83	0733 <sup>f</sup>	10.146	25	80	5.9 <sup>e</sup> 10.3 <sup>e</sup>	10 <sup>e</sup> 350 <sup>e</sup>	45,900	76	278	1 day delay due to excessive wind loads, calculated at high altitudes.
8	STS-8 Challenger	8/30/83	0232 <sup>f</sup>	10.111	24	97	8.8 14.0	269 268	45,100	30	349	
9	STS-9 (SL-1) Columbia	11/28/83	1100	10.153	24	83	19.1 32.0	183 190	47,100	117	252	
10	STS-11 (41-B) Challenger	2/3/84	0800	10.173	17	75	0.0 NA	0 NA	38,200	143	288	1 day delay due to excessive wind loads, calculated at high altitudes.
11	STS-13 (41-C) Challenger	4/6/84	0858	10.149	16	56	21.5 18.6	320 275	37,700	176	289	
12	STS-41D Discovery	8/30/84	0842 <sup>f</sup>	10.172	26	81	3.0 3.6	106 39	40,300	44	270	
13	STS-41G Challenger	10/5/84	0703 <sup>f</sup>	10.210	23	60	16.5 14.8	73 58	40,600	78	303	1 day delay due to excessive wind loads, calculated at high altitudes.
14	STS-51A Discovery	11/8/84	0715	10.227	20	59	3.0 31.1	24 10	33,100	131	272	

- a. Pad 39A thermodynamic measurements taken at approximately 1.2 m (4 ft) above natural grade at camera site No. 3.  
b. 1 min average prior to L+0 of 60 ft PLP (listed first) and 275 ft FSS winds measured above natural grade.  
c. Pressure measurement applicable to 21 ft above MSL unless otherwise indicated.  
d. Pressure measurement applicable to 14 ft above MSL.  
e. 10 sec average prior to L+0.  
f. Eastern Daylight Time.  
g. 30 sec average prior to L+0.  
h. All vehicles launched from LC39A.

TABLE 1. (Concluded)

Vehicle Data <sup>h</sup>				Surface Observations				Inflight Conditions Max. Wind Below 60,000 ft			Count Down and Launch Comments of Meteorological Significance	
Seq. No.	Vehicle No.	Launch Date	Time (EST) Nearest Minute	Thermodynamic <sup>a</sup>			Wind <sup>b</sup>		Alt. (ft)	Speed (ft/sec)		Dir. (deg)
				Press. <sup>c</sup> N/cm <sup>2</sup>	Temp. (°C)	Rel. Hum. (%)	Speed (ft/sec)	Dir. (deg)				
15	STS-51C Discovery	1/24/85	1450	10.173	18	46	17.1 15.5	228 253	42,900	199	265	1 day delay due to cold surface temperatures  55-min delay, due to a ship in SRB impact area, and concerns over potential weather related impacts (cloud cover)
16	STS-51D Discovery	4/12/85	1359	10.257	21	55	19.9 22.3	82 82	42,600	134	265	

TABLE 2. SYSTEMS USED TO MEASURE UPPER AIR WIND DATA FOR STS-51D ASCENT

Type of Data	Date: April 12, 1985		Portion of Data Used			
	Release Time		Start		End	
	Time (UT) (hr:min)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)	Altitude m (ft)	Time After L+0 (min)
FPS-16 Jimsphere	14:46	47	6 (21)	47	16,764 (55,000)	105
MSS Rawinsonde	14:02	3	17,069 (56,000)	59	29,870 (98,000)	101
Super-Loki Rocketsonde (Datasonde)	16:00	121	60,655 (199,000)	121	30,175 (99,000)	140

TABLE 3. SURFACE OBSERVATIONS AT STS-51D LAUNCH TIME

Location <sup>a</sup>	Time After L+0 (min)	Pressure (MSL) N/cm <sup>2</sup> (psia)	Temperature °K (°F)	Dew Point °K (°F)	Relative Humidity (%)	Visibility km (miles)	Sky Cover			Wind	
							Cloud** Amount	Cloud Type	Height of Base Meters (ft)	Speed ft/sec (kt)	Direction (deg)
NASA Space Shuttle Runway X68e Winds Measured at 10.4 m (34 ft)	0	10.264 (14.887)	294.3 (70.0)	286.5 (56.0)	62	16 (10)	1	Alto-Cumulus	2,438 (8,000)	11.8 (7.0)	90
CCAES XMR <sup>c</sup> Surface Measurements	0	10.261 (14.883)	294.5 (70.4)	288.2 (59.0)	67	16 (10)	1	Strato-Cumulus	793 (2,600)	16.9 (10.0)	80
Pad 39A <sup>c</sup> Lightpole SE 18.3 m (60.0 ft)	0	10.257* (14.877)*	293.8 (69.2)	284.4 (52.2)	55	-	4	Alto-stratus	2,438 (8,000)	19.9 <sup>b</sup> (11.8)	82 <sup>b</sup>
Pad 39A FSS (Top SE) 83.8 m (275 ft)	0	-	-	-	-	-	10	Alto-stratus	4,572 (15,000)	22.3 <sup>b</sup> (13.2)	82 <sup>b</sup>

\*Pad 39A Camera Site 3 barometric pressure instrument appeared to be reading too high. Therefore, the KSC Shuttle runway station pressure value interpolated to 10.257 N/cm<sup>2</sup> at 21 ft above MSL was used as the L+0 pad atmospheric pressure measurement.

\*\*10/10 total sky cover reported at both X68 and XMR.

- Altitudes of measurements are above natural grade, except where noted.
- Approximately 1 min average prior to L+0.
- Balloon release site.
- Pad 39A thermodynamic measurements are taken at camera site No. 3, approximately 6.4 m (21 ft) above MSL.
- Official STS-51D sky observational site.

TABLE 4. STS-51D PRE-LAUNCH THROUGH LAUNCH KSC PAD 39A ATMOSPHERIC MEASUREMENTS<sup>a</sup>

Hourly Atmospheric Measurements							Sky Condition <sup>b</sup>				
12 April 1985 Time UT	Temp. (°F)	Dew Point (°F)	RH (%)	275' Level (SE)		60' Level (SE)		Clouds	Total Sky Cover	Vis. (mi)	Other Remarks
				WS Kt	WD°	WS Kt	WD°				
0700	68	50	52	19	087	20	091	Scattered at 3500 ft and overcast at 22,000 ft	10/10	10	
0800	68	52	57	19	083	17	092	Scattered at 3500 ft and overcast at 20,000 ft	10/10	10	
0900	67	50	55	18	081	19	089	Scattered at 4500 ft and overcast at 12,000 ft	10/10	10	
1000	67	50	54	18	083	16	091	Scattered at 4000 ft and overcast at 12,000 ft	10/10	10	
1100	67	50	54	17	084	16	091	Scattered at 3500 ft and overcast at 14,000 ft	10/10	10	
1200	68	52	56	15	097	18	101	Scattered at 3300 and 8000 ft and overcast at 14,000	10/10	10	
1300	68	52	56	16	090	15	095	Scattered at 8000 ft and overcast at 15,000 ft	10/10	10	
L+0 <sup>c</sup> 1359	69	52	55	13	082	12	082	Scattered at 8000 ft and overcast at 15,000 ft	10/10	10	

a. Hourly pad observations (obtained via MSFC/HOSC) averaged over 2 min, centered on the hour.

b. Sky observations taken at the Shuttle runway site X68.

c. L+0 PAD Wind and thermodynamic parameters obtained from HOSC data bank. SE Anemometers used at 60 and 275 ft levels for L+0 wind conditions (approximately 1 min prior to L+0). Pad 39A L+0 atmospheric pressure, at 21 ft (MSL), was corrected to 10.257 N/cm<sup>2</sup>. Sea level pressure was 10.264 N/cm<sup>2</sup>.

TABLE 5. STS-51D ASCENT ATMOSPHERIC DATA TAPE

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
000021	017	080	20.7	.1026+04	.1210+04	11.4
000100	021	081	20.4	.1023+04	.1208+04	11.3
000200	022	082	19.9	.1019+04	.1205+04	11.2
000300	022	085	19.5	.1016+04	.1203+04	11.1
000400	022	088	19.0	.1012+04	.1201+04	10.9
000500	024	088	18.6	.1008+04	.1198+04	10.8
000600	026	088	18.2	.1005+04	.1196+04	10.7
000700	027	079	17.7	.1001+04	.1193+04	10.6
000800	027	084	17.3	.9975+03	.1191+04	10.4
000900	027	092	16.8	.9939+03	.1188+04	10.3
001000	028	088	16.4	.9904+03	.1186+04	10.2
001100	029	085	16.1	.9869+03	.1183+04	10.2
001200	029	087	15.8	.9833+03	.1180+04	10.2
001300	030	095	15.5	.9798+03	.1177+04	10.2
001400	032	092	15.2	.9763+03	.1174+04	10.2
001500	031	087	14.9	.9728+03	.1171+04	10.2
001600	029	091	14.6	.9693+03	.1168+04	10.2
001700	030	099	14.3	.9659+03	.1165+04	10.2
001800	034	099	14.0	.9624+03	.1162+04	10.2
001900	034	095	13.7	.9590+03	.1159+04	10.2
002000	032	089	13.4	.9556+03	.1156+04	10.2
002100	030	094	13.2	.9521+03	.1153+04	10.0
002200	031	101	12.9	.9487+03	.1150+04	9.9
002300	035	102	12.7	.9452+03	.1146+04	9.8
002400	036	098	12.5	.9418+03	.1143+04	9.6
002500	033	097	12.3	.9384+03	.1140+04	9.4
002600	034	104	12.0	.9350+03	.1137+04	9.3
002700	036	107	11.8	.9316+03	.1134+04	9.1
002800	038	105	11.6	.9283+03	.1130+04	9.0
002900	038	101	11.3	.9249+03	.1127+04	8.9
003000	036	101	11.1	.9215+03	.1124+04	8.7
003100	037	107	10.9	.9182+03	.1121+04	8.5
003200	040	107	10.7	.9148+03	.1118+04	8.2
003300	040	105	10.5	.9115+03	.1114+04	8.0
003400	037	105	10.3	.9082+03	.1111+04	7.7
003500	038	109	10.1	.9049+03	.1108+04	7.5
003600	041	109	10.0	.9016+03	.1105+04	7.3
003700	040	107	9.8	.8983+03	.1101+04	7.0
003800	039	108	9.6	.8950+03	.1098+04	6.8
003900	042	111	9.4	.8918+03	.1095+04	6.5
004000	042	108	9.2	.8885+03	.1092+04	6.3
004100	039	106	9.0	.8853+03	.1089+04	6.0
004200	041	112	8.8	.8820+03	.1085+04	5.7
004300	045	108	8.6	.8786+03	.1082+04	5.5
004400	041	110	8.4	.8755+03	.1079+04	5.2
004500	039	119	8.2	.8723+03	.1076+04	4.9
004600	041	119	8.0	.8691+03	.1073+04	4.6
004700	038	117	7.8	.8659+03	.1070+04	4.3
004800	037	119	7.6	.8628+03	.1067+04	4.1
004900	040	120	7.4	.8596+03	.1064+04	3.8

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
005000	038	114	7.2	.8564+03	.1061+04	3.5
005100	036	122	7.5	.8533+03	.1056+04	1.9
005200	037	126	7.7	.8502+03	.1052+04	.4
005300	037	118	8.0	.8471+03	.1047+04	-1.2
005400	031	124	8.2	.8440+03	.1043+04	-2.8
005500	027	130	8.5	.8409+03	.1038+04	-4.3
005600	024	123	8.8	.8378+03	.1033+04	-5.9
005700	022	124	9.0	.8347+03	.1029+04	-7.5
005800	023	132	9.3	.8317+03	.1024+04	-9.1
005900	025	130	9.5	.8286+03	.1020+04	-10.6
006000	023	134	9.8	.8256+03	.1015+04	-12.2
006100	026	134	9.6	.8226+03	.1012+04	-12.3
006200	026	133	9.5	.8195+03	.1009+04	-12.5
006300	026	133	9.3	.8165+03	.1006+04	-12.6
006400	027	136	9.1	.8135+03	.1003+04	-12.8
006500	025	134	9.0	.8105+03	.9999+03	-12.9
006600	026	134	8.8	.8075+03	.9968+03	-13.0
006700	023	134	8.6	.8046+03	.9937+03	-13.2
006800	025	140	8.4	.8016+03	.9907+03	-13.3
006900	022	141	8.3	.7987+03	.9877+03	-13.5
007000	018	142	8.1	.7957+03	.9846+03	-13.6
007100	019	144	7.9	.7928+03	.9818+03	-13.4
007200	013	145	7.6	.7899+03	.9790+03	-13.1
007300	018	112	7.4	.7870+03	.9762+03	-12.9
007400	021	111	7.1	.7840+03	.9734+03	-12.7
007500	024	107	6.9	.7812+03	.9706+03	-12.5
007600	028	096	6.7	.7783+03	.9678+03	-12.2
007700	030	100	6.4	.7754+03	.9650+03	-12.0
007800	024	095	6.2	.7725+03	.9623+03	-11.8
007900	026	093	5.9	.7697+03	.9595+03	-11.5
008000	023	096	5.7	.7668+03	.9568+03	-11.3
008100	023	093	5.4	.7640+03	.9542+03	-11.1
008200	024	093	5.1	.7611+03	.9517+03	-10.8
008300	021	105	4.8	.7583+03	.9492+03	-10.6
008400	021	101	4.5	.7554+03	.9467+03	-10.4
008500	023	104	4.2	.7526+03	.9441+03	-10.2
008600	020	104	3.8	.7498+03	.9416+03	-9.9
008700	024	104	3.5	.7470+03	.9391+03	-9.7
008800	027	105	3.2	.7442+03	.9366+03	-9.5
008900	027	112	2.9	.7414+03	.9342+03	-9.2
009000	024	113	2.6	.7386+03	.9317+03	-9.0
009100	024	108	2.3	.7359+03	.9293+03	-8.9
009200	024	108	1.9	.7331+03	.9269+03	-8.8
009300	022	106	1.6	.7303+03	.9245+03	-8.6
009400	027	106	1.3	.7276+03	.9221+03	-8.5
009500	026	101	1.0	.7248+03	.9197+03	-8.4
009600	023	104	.6	.7221+03	.9173+03	-8.3
009700	024	100	.3	.7194+03	.9149+03	-8.2
009800	025	112	.0	.7167+03	.9125+03	-8.0
009900	026	110	-.4	.7140+03	.9102+03	-7.9



TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/CM <sup>3</sup> )	DEN POINT (DEG C)
010000	025	106	-1.7	.7113+03	.9078+03	-7.8
010100	023	108	-1.0	.7086+03	.9053+03	-7.7
010200	025	108	-1.3	.7059+03	.9028+03	-7.5
010300	026	106	-1.6	.7032+03	.9003+03	-7.4
010400	022	090	-1.9	.7005+03	.8978+03	-7.3
010500	024	102	-2.1	.6978+03	.8953+03	-7.2
010600	025	095	-2.4	.6951+03	.8928+03	-7.0
010700	022	085	-2.7	.6925+03	.8903+03	-6.9
010800	025	080	-3.0	.6899+03	.8879+03	-6.8
010900	025	083	-3.3	.6872+03	.8854+03	-6.6
011000	026	091	-3.6	.6846+03	.8829+03	-6.5
011100	025	086	-3.7	.6820+03	.8798+03	-6.3
011200	026	091	-3.8	.6794+03	.8766+03	-6.1
011300	027	088	-3.8	.6767+03	.8735+03	-5.9
011400	027	079	-3.9	.6741+03	.8703+03	-5.7
011500	019	076	-4.0	.6716+03	.8672+03	-5.5
011600	022	126	-4.1	.6690+03	.8641+03	-5.2
011700	027	128	-4.2	.6664+03	.8610+03	-5.0
011800	026	134	-4.2	.6638+03	.8579+03	-4.8
011900	025	150	-4.3	.6613+03	.8548+03	-4.6
012000	027	159	-4.4	.6588+03	.8518+03	-4.4
012100	030	163	-4.5	.6562+03	.8483+03	-4.4
012200	036	159	-4.3	.6537+03	.8449+03	-4.3
012300	031	160	-4.3	.6511+03	.8416+03	-4.3
012400	030	164	-4.2	.6487+03	.8382+03	-4.2
012500	032	173	-4.2	.6462+03	.8348+03	-4.2
012600	035	168	-4.2	.6437+03	.8315+03	-4.2
012700	033	167	-4.1	.6413+03	.8281+03	-4.1
012800	033	173	-4.1	.6388+03	.8248+03	-4.1
012900	035	174	-4.0	.6363+03	.8215+03	-4.0
013000	031	172	-4.0	.6339+03	.8182+03	-4.0
013100	031	175	-4.2	.6314+03	.8156+03	-4.2
013200	034	176	-4.3	.6290+03	.8129+03	-4.3
013300	029	190	-4.5	.6266+03	.8103+03	-4.5
013400	033	179	-4.6	.6242+03	.8077+03	-4.6
013500	031	178	-4.8	.6218+03	.8051+03	-4.8
013600	031	179	-5.0	.6194+03	.8025+03	-5.0
013700	035	182	-5.1	.6170+03	.7999+03	-5.1
013800	034	184	-5.3	.6146+03	.7973+03	-5.3
013900	033	188	-5.4	.6123+03	.7947+03	-5.4
014000	038	191	-5.6	.6099+03	.7921+03	-5.6
014100	036	193	-5.7	.6075+03	.7895+03	-5.7
014200	035	200	-5.9	.6052+03	.7869+03	-5.9
014300	039	199	-6.0	.6028+03	.7843+03	-6.0
014400	039	197	-6.2	.6005+03	.7818+03	-6.2
014500	040	200	-6.3	.5982+03	.7792+03	-6.3
014600	041	201	-6.5	.5959+03	.7766+03	-6.5
014700	037	203	-6.6	.5936+03	.7740+03	-6.6
014800	041	205	-6.8	.5913+03	.7715+03	-6.8
014900	040	204	-6.9	.5890+03	.7690+03	-6.9

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
015000	039	205	-7.1	.5867+03	.7669+03	-7.1
015100	042	204	-7.2	.5844+03	.7638+03	-7.2
015200	042	203	-7.4	.5821+03	.7612+03	-7.4
015300	040	205	-7.5	.5799+03	.7587+03	-7.5
015400	043	203	-7.6	.5776+03	.7561+03	-7.6
015500	042	202	-7.7	.5754+03	.7535+03	-7.7
015600	040	204	-7.9	.5731+03	.7510+03	-7.9
015700	041	208	-8.0	.5709+03	.7485+03	-8.0
015800	041	204	-8.1	.5687+03	.7459+03	-8.1
015900	040	204	-8.3	.5664+03	.7434+03	-8.3
016000	040	206	-8.4	.5642+03	.7408+03	-8.4
016100	041	201	-8.6	.5620+03	.7384+03	-8.6
016200	038	201	-8.7	.5598+03	.7360+03	-8.7
016300	039	205	-8.9	.5576+03	.7335+03	-8.9
016400	040	203	-9.0	.5555+03	.7311+03	-9.0
016500	041	199	-9.2	.5533+03	.7287+03	-9.2
016600	037	202	-9.4	.5511+03	.7263+03	-9.4
016700	038	207	-9.5	.5490+03	.7239+03	-9.5
016800	039	204	-9.7	.5468+03	.7215+03	-9.7
016900	037	203	-9.8	.5447+03	.7192+03	-9.8
017000	037	205	-10.0	.5425+03	.7168+03	-10.0
017100	038	205	-10.2	.5404+03	.7145+03	-10.2
017200	037	201	-10.4	.5383+03	.7122+03	-10.4
017300	035	201	-10.5	.5361+03	.7099+03	-10.5
017400	036	201	-10.7	.5340+03	.7076+03	-10.7
017500	036	199	-10.9	.5319+03	.7053+03	-10.9
017600	035	202	-11.1	.5298+03	.7030+03	-11.1
017700	037	201	-11.3	.5277+03	.7007+03	-11.3
017800	038	198	-11.4	.5257+03	.6984+03	-11.4
017900	037	198	-11.6	.5236+03	.6962+03	-11.6
018000	041	198	-11.8	.5215+03	.6939+03	-11.8
018100	042	194	-12.0	.5195+03	.6917+03	-12.0
018200	041	195	-12.2	.5174+03	.6895+03	-12.2
018300	043	194	-12.4	.5153+03	.6872+03	-12.4
018400	041	194	-12.6	.5133+03	.6850+03	-12.6
018500	038	197	-12.7	.5113+03	.6828+03	-12.7
018600	038	199	-12.9	.5092+03	.6806+03	-12.9
018700	038	196	-13.1	.5072+03	.6784+03	-13.1
018800	036	193	-13.3	.5052+03	.6762+03	-13.3
018900	035	198	-13.5	.5032+03	.6741+03	-13.5
019000	039	200	-13.7	.5012+03	.6719+03	-13.7
019100	037	198	-13.9	.4992+03	.6697+03	-13.9
019200	033	199	-14.1	.4972+03	.6676+03	-14.1
019300	036	204	-14.3	.4952+03	.6654+03	-14.3
019400	038	208	-14.5	.4932+03	.6633+03	-14.5
019500	035	211	-14.7	.4913+03	.6612+03	-14.7
019600	034	217	-14.9	.4893+03	.6591+03	-14.9
019700	037	219	-15.1	.4873+03	.6569+03	-15.1
019800	036	220	-15.3	.4854+03	.6548+03	-15.3
019900	037	223	-15.5	.4834+03	.6527+03	-15.5

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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
020000	037	222	-15.7	.9815+03	.6506+03	-15.7
020100	038	223	-15.9	.9796+03	.6486+03	-15.9
020200	037	227	-16.1	.9776+03	.6465+03	-16.1
020300	041	228	-16.3	.9757+03	.6444+03	-16.3
020400	039	226	-16.5	.9738+03	.6423+03	-16.5
020500	038	226	-16.7	.9719+03	.6403+03	-16.7
020600	040	224	-17.0	.9700+03	.6382+03	-17.0
020700	039	223	-17.2	.9681+03	.6362+03	-17.2
020800	037	227	-17.4	.9662+03	.6342+03	-17.4
020900	039	229	-17.6	.9643+03	.6321+03	-17.6
021000	039	227	-17.8	.9625+03	.6301+03	-17.8
021100	037	226	-18.0	.9606+03	.6280+03	-18.0
021200	037	233	-18.2	.9587+03	.6259+03	-18.2
021300	038	235	-18.3	.9568+03	.6238+03	-18.3
021400	036	236	-18.5	.9550+03	.6217+03	-18.5
021500	037	240	-18.7	.9531+03	.6197+03	-18.7
021600	037	239	-18.9	.9513+03	.6176+03	-18.9
021700	034	241	-19.1	.9494+03	.6155+03	-19.1
021800	035	246	-19.2	.9476+03	.6135+03	-19.2
021900	036	244	-19.4	.9458+03	.6114+03	-19.4
022000	034	243	-19.6	.9440+03	.6094+03	-19.6
022100	037	247	-19.8	.9422+03	.6073+03	-19.8
022200	036	244	-20.0	.9404+03	.6053+03	-20.0
022300	034	246	-20.2	.9386+03	.6034+03	-20.2
022400	035	248	-20.4	.9368+03	.6014+03	-20.4
022500	035	247	-20.6	.9350+03	.5994+03	-20.6
022600	031	253	-20.8	.9332+03	.5974+03	-20.8
022700	032	255	-21.0	.9314+03	.5955+03	-21.0
022800	033	255	-21.2	.9297+03	.5935+03	-21.2
022900	033	260	-21.4	.9279+03	.5915+03	-21.4
023000	035	262	-21.6	.9261+03	.5896+03	-21.6
023100	033	267	-21.8	.9244+03	.5877+03	-21.8
023200	033	263	-22.0	.9226+03	.5857+03	-22.0
023300	032	262	-22.2	.9209+03	.5838+03	-22.2
023400	032	266	-22.4	.9192+03	.5819+03	-22.4
023500	035	263	-22.6	.9174+03	.5800+03	-22.6
023600	036	260	-22.9	.9157+03	.5781+03	-23.1
023700	040	260	-23.1	.9140+03	.5762+03	-23.3
023800	039	254	-23.3	.9123+03	.5743+03	-23.6
023900	037	255	-23.5	.9106+03	.5724+03	-23.8
024000	040	248	-23.7	.9089+03	.5706+03	-24.1
024100	039	248	-23.9	.9072+03	.5687+03	-24.3
024200	041	245	-24.1	.9055+03	.5667+03	-24.6
024300	040	246	-24.3	.9038+03	.5649+03	-24.8
024400	043	248	-24.5	.9021+03	.5630+03	-25.0
024500	040	239	-24.7	.9004+03	.5611+03	-25.2
024600	041	242	-24.9	.8988+03	.5592+03	-25.5
024700	043	243	-25.1	.8971+03	.5573+03	-25.7
024800	042	238	-25.3	.8955+03	.5555+03	-25.9
024900	043	239	-25.5	.8938+03	.5536+03	-26.2

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
025000	044	237	-25.7	.3922+03	.5518+03	-26.4
025100	042	234	-25.9	.3905+03	.5499+03	-26.6
025200	042	232	-26.1	.3889+03	.5481+03	-26.9
025300	046	237	-26.3	.3873+03	.5462+03	-27.1
025400	047	236	-26.5	.3856+03	.5444+03	-27.3
025500	047	239	-26.7	.3840+03	.5426+03	-27.5
025600	049	241	-27.0	.3824+03	.5408+03	-27.8
025700	052	244	-27.2	.3808+03	.5390+03	-28.0
025800	053	243	-27.4	.3792+03	.5372+03	-28.2
025900	054	247	-27.6	.3776+03	.5354+03	-28.5
026000	057	242	-27.8	.3760+03	.5336+03	-28.7
026100	059	245	-28.0	.3744+03	.5318+03	-29.0
026200	056	247	-28.2	.3729+03	.5301+03	-29.3
026300	057	245	-28.5	.3713+03	.5283+03	-29.5
026400	058	242	-28.7	.3697+03	.5266+03	-29.8
026500	057	243	-28.9	.3681+03	.5248+03	-30.1
026600	058	244	-29.1	.3666+03	.5231+03	-30.4
026700	059	243	-29.3	.3650+03	.5213+03	-30.7
026800	058	242	-29.6	.3635+03	.5196+03	-30.9
026900	060	243	-29.8	.3620+03	.5179+03	-31.2
027000	062	242	-30.0	.3604+03	.5161+03	-31.5
027100	061	243	-30.2	.3589+03	.5145+03	-31.8
027200	063	245	-30.5	.3573+03	.5128+03	-32.1
027300	062	242	-30.7	.3558+03	.5111+03	-32.4
027400	063	244	-31.0	.3543+03	.5094+03	-32.7
027500	063	242	-31.2	.3528+03	.5077+03	-33.0
027600	063	242	-31.4	.3513+03	.5061+03	-33.3
027700	063	243	-31.7	.3498+03	.5044+03	-33.6
027800	062	244	-31.9	.3483+03	.5028+03	-33.9
027900	063	246	-32.2	.3468+03	.5011+03	-34.2
028000	061	244	-32.4	.3453+03	.4995+03	-34.5
028100	061	246	-32.7	.3438+03	.4979+03	-34.8
028200	061	245	-32.9	.3423+03	.4963+03	-35.1
028300	060	244	-33.2	.3409+03	.4947+03	-35.4
028400	061	244	-33.4	.3394+03	.4931+03	-35.7
028500	058	243	-33.7	.3379+03	.4915+03	-36.0
028600	059	245	-34.0	.3365+03	.4899+03	-36.3
028700	059	242	-34.2	.3350+03	.4883+03	-36.6
028800	059	245	-34.5	.3336+03	.4867+03	-36.9
028900	061	245	-34.7	.3321+03	.4852+03	-37.2
029000	060	246	-35.0	.3307+03	.4836+03	-37.5
029100	061	246	-35.3	.3293+03	.4821+03	-37.8
029200	059	245	-35.6	.3278+03	.4805+03	-38.1
029300	059	249	-35.8	.3264+03	.4790+03	-38.4
029400	062	249	-36.1	.3250+03	.4775+03	-38.7
029500	059	248	-36.4	.3235+03	.4760+03	-39.0
029600	057	253	-36.7	.3221+03	.4745+03	-39.3
029700	061	251	-37.0	.3207+03	.4729+03	-39.6
029800	059	252	-37.2	.3193+03	.4714+03	-39.9
029900	058	253	-37.5	.3179+03	.4699+03	-40.2

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
030000	062	253	-37.8	.3165+03	.4684+03	-40.5
030100	060	254	-38.1	.3151+03	.4669+03	-40.7
030200	061	255	-38.4	.3137+03	.4654+03	-40.9
030300	061	257	-38.6	.3124+03	.4639+03	-41.2
030400	058	257	-38.9	.3110+03	.4624+03	-41.4
030500	058	258	-39.2	.3096+03	.4609+03	-41.6
030600	062	256	-39.5	.3082+03	.4595+03	-41.8
030700	060	255	-39.8	.3069+03	.4580+03	-42.0
030800	062	255	-40.3	.3055+03	.4565+03	-42.3
030900	062	255	-40.3	.3042+03	.4550+03	-42.5
031000	061	256	-40.6	.3028+03	.4536+03	-42.7
031100	063	257	-40.9	.3015+03	.4521+03	-43.0
031200	061	254	-41.2	.3001+03	.4506+03	-43.3
031300	062	257	-41.4	.2988+03	.4491+03	-43.6
031400	062	257	-41.7	.2975+03	.4477+03	-43.9
031500	059	258	-42.0	.2961+03	.4462+03	-44.2
031600	061	257	-42.3	.2948+03	.4448+03	-44.6
031700	060	257	-42.6	.2935+03	.4433+03	-44.9
031800	063	258	-42.8	.2922+03	.4419+03	-45.2
031900	063	256	-43.1	.2909+03	.4404+03	-45.5
032000	063	258	-43.4	.2896+03	.4390+03	-45.8
032100	067	257	-43.7	.2883+03	.4376+03	-46.3
032200	067	259	-44.0	.2870+03	.4362+03	-46.7
032300	068	260	-44.3	.2857+03	.4348+03	-47.2
032400	068	258	-44.6	.2844+03	.4335+03	-47.6
032500	068	260	-44.9	.2831+03	.4321+03	-48.1
032600	070	259	-45.3	.2818+03	.4307+03	-48.6
032700	071	260	-45.6	.2805+03	.4293+03	-49.0
032800	072	260	-45.9	.2792+03	.4280+03	-49.5
032900	074	260	-46.2	.2780+03	.4266+03	-49.9
033000	077	260	-46.5	.2767+03	.4253+03	-50.4
033100	075	260	-46.8	.2754+03	.4239+03	-50.9
033200	077	259	-47.1	.2742+03	.4224+03	-51.3
033300	076	259	-47.3	.2729+03	.4210+03	-51.8
033400	078	258	-47.6	.2717+03	.4196+03	-52.3
033500	077	259	-47.9	.2704+03	.4182+03	-52.7
033600	079	258	-48.2	.2692+03	.4168+03	-53.2
033700	080	258	-48.5	.2679+03	.4154+03	-53.7
033800	079	257	-48.7	.2667+03	.4140+03	-54.2
033900	081	257	-49.0	.2655+03	.4126+03	-54.6
034000	080	257	-49.3	.2643+03	.4113+03	-55.1
034100	083	256	-49.6	.2631+03	.4099+03	-55.4
034200	083	255	-49.8	.2618+03	.4084+03	-55.7
034300	084	259	-50.1	.2606+03	.4070+03	-55.9
034400	082	257	-50.4	.2594+03	.4056+03	-56.2
034500	087	257	-50.6	.2582+03	.4042+03	-56.5
034600	087	256	-50.9	.2570+03	.4029+03	-56.8
034700	088	257	-51.2	.2558+03	.4015+03	-57.1
034800	089	259	-51.5	.2546+03	.4001+03	-57.3
034900	088	258	-51.7	.2534+03	.3987+03	-57.6

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
035000	090	258	-52.0	.2523+03	.3974+03	-57.9
035100	090	258	-52.2	.2511+03	.3959+03	-58.1
035200	090	259	-52.5	.2499+03	.3945+03	-58.3
035300	093	259	-52.7	.2487+03	.3931+03	-58.5
035400	091	258	-53.0	.2476+03	.3916+03	-58.7
035500	090	259	-53.2	.2464+03	.3902+03	-58.8
035600	092	260	-53.4	.2452+03	.3888+03	-59.0
035700	094	259	-53.7	.2441+03	.3874+03	-59.2
035800	092	260	-53.9	.2429+03	.3860+03	-59.4
035900	091	259	-54.2	.2418+03	.3846+03	-59.6
036000	093	260	-54.4	.2407+03	.3832+03	-59.8
036100	091	260	-54.6	.2395+03	.3818+03	-60.0
036200	094	260	-54.8	.2384+03	.3804+03	-60.2
036300	095	259	-55.1	.2372+03	.3790+03	-60.4
036400	096	259	-55.3	.2361+03	.3775+03	-60.6
036500	097	261	-55.5	.2350+03	.3761+03	-60.7
036600	098	259	-55.7	.2339+03	.3747+03	-60.9
036700	097	259	-55.9	.2328+03	.3733+03	-61.1
036800	099	258	-56.2	.2317+03	.3719+03	-61.3
036900	099	260	-56.4	.2306+03	.3705+03	-61.5
037000	101	261	-56.6	.2295+03	.3692+03	-61.7
037100	101	262	-56.8	.2284+03	.3678+03	-61.9
037200	103	261	-57.1	.2273+03	.3664+03	-62.1
037300	099	260	-57.3	.2262+03	.3650+03	-62.3
037400	100	263	-57.5	.2251+03	.3637+03	-62.5
037500	102	262	-57.7	.2240+03	.3623+03	-62.7
037600	103	263	-58.0	.2229+03	.3610+03	-62.9
037700	106	265	-58.2	.2219+03	.3596+03	-63.1
037800	107	263	-58.4	.2208+03	.3583+03	-63.3
037900	107	263	-58.7	.2198+03	.3569+03	-63.5
038000	110	262	-58.9	.2187+03	.3556+03	-63.7
038100	112	263	-59.1	.2176+03	.3542+03	-9999.
038200	112	265	-59.3	.2166+03	.3528+03	-9999.
038300	113	264	-59.4	.2155+03	.3513+03	-9999.
038400	114	264	-59.6	.2145+03	.3499+03	-9999.
038500	116	265	-59.8	.2135+03	.3485+03	-9999.
038600	118	263	-60.0	.2124+03	.3471+03	-9999.
038700	118	262	-60.2	.2114+03	.3458+03	-9999.
038800	121	262	-60.3	.2104+03	.3444+03	-9999.
038900	123	260	-60.5	.2094+03	.3430+03	-9999.
039000	123	261	-60.7	.2083+03	.3416+03	-9999.
039100	124	261	-60.9	.2072+03	.3403+03	-9999.
039200	123	259	-61.1	.2063+03	.3389+03	-9999.
039300	123	260	-61.3	.2053+03	.3376+03	-9999.
039400	126	259	-61.5	.2043+03	.3362+03	-9999.
039500	125	258	-61.6	.2033+03	.3349+03	-9999.
039600	126	257	-61.8	.2023+03	.3335+03	-9999.
039700	126	256	-62.0	.2013+03	.3322+03	-9999.
039800	127	257	-62.2	.2003+03	.3309+03	-9999.
039900	129	258	-62.4	.1994+03	.3296+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
040000	128	257	-62.6	.1984+03	.3282+03	-9999.
040100	126	256	-62.9	.1974+03	.3270+03	-9999.
040200	125	255	-63.1	.1964+03	.3258+03	-9999.
040300	128	258	-63.4	.1955+03	.3246+03	-9999.
040400	128	259	-63.6	.1945+03	.3234+03	-9999.
040500	128	260	-63.9	.1935+03	.3222+03	-9999.
040600	122	259	-64.2	.1926+03	.3210+03	-9999.
040700	127	261	-64.4	.1916+03	.3198+03	-9999.
040800	127	262	-64.7	.1907+03	.3187+03	-9999.
040900	127	261	-64.9	.1898+03	.3175+03	-9999.
041000	125	260	-65.2	.1888+03	.3163+03	-9999.
041100	125	261	-65.2	.1879+03	.3147+03	-9999.
041200	125	261	-65.1	.1870+03	.3131+03	-9999.
041300	124	261	-65.1	.1860+03	.3115+03	-9999.
041400	125	261	-65.0	.1851+03	.3099+03	-9999.
041500	121	261	-65.0	.1842+03	.3083+03	-9999.
041600	124	261	-65.0	.1833+03	.3067+03	-9999.
041700	125	261	-64.9	.1824+03	.3051+03	-9999.
041800	122	261	-64.9	.1815+03	.3035+03	-9999.
041900	123	264	-64.8	.1806+03	.3020+03	-9999.
042000	124	264	-64.8	.1797+03	.3004+03	-9999.
042100	127	265	-64.8	.1788+03	.2989+03	-9999.
042200	129	264	-64.8	.1779+03	.2974+03	-9999.
042300	133	264	-64.7	.1770+03	.2959+03	-9999.
042400	133	264	-64.7	.1761+03	.2944+03	-9999.
042500	133	266	-64.7	.1753+03	.2929+03	-9999.
042600	134	265	-64.7	.1744+03	.2914+03	-9999.
042700	129	268	-64.7	.1735+03	.2899+03	-9999.
042800	126	270	-64.6	.1727+03	.2885+03	-9999.
042900	121	269	-64.6	.1718+03	.2870+03	-9999.
043000	114	266	-64.6	.1710+03	.2856+03	-9999.
043100	112	269	-64.6	.1701+03	.2842+03	-9999.
043200	106	268	-64.6	.1693+03	.2828+03	-9999.
043300	103	268	-64.6	.1684+03	.2814+03	-9999.
043400	101	266	-64.6	.1676+03	.2800+03	-9999.
043500	098	265	-64.6	.1668+03	.2786+03	-9999.
043600	098	262	-64.6	.1659+03	.2772+03	-9999.
043700	097	261	-64.6	.1651+03	.2758+03	-9999.
043800	098	262	-64.6	.1643+03	.2745+03	-9999.
043900	097	264	-64.6	.1635+03	.2731+03	-9999.
044000	096	263	-64.6	.1627+03	.2717+03	-9999.
044100	096	263	-64.6	.1619+03	.2705+03	-9999.
044200	091	262	-64.7	.1611+03	.2692+03	-9999.
044300	088	262	-64.7	.1603+03	.2679+03	-9999.
044400	086	258	-64.8	.1595+03	.2666+03	-9999.
044500	084	258	-64.8	.1587+03	.2653+03	-9999.
044600	084	257	-64.8	.1579+03	.2641+03	-9999.
044700	084	257	-64.9	.1571+03	.2628+03	-9999.
044800	083	256	-64.9	.1563+03	.2616+03	-9999.
044900	081	256	-65.0	.1556+03	.2603+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
045000	079	257	-65.0	.1548+03	.2591+03	-9999.
045100	079	254	-65.0	.1540+03	.2579+03	-9999.
045200	079	255	-65.1	.1533+03	.2566+03	-9999.
045300	081	256	-65.1	.1525+03	.2554+03	-9999.
045400	081	254	-65.2	.1518+03	.2542+03	-9999.
045500	081	256	-65.3	.1510+03	.2530+03	-9999.
045600	084	255	-65.3	.1502+03	.2518+03	-9999.
045700	087	256	-65.3	.1495+03	.2506+03	-9999.
045800	089	255	-65.4	.1488+03	.2495+03	-9999.
045900	090	256	-65.4	.1480+03	.2483+03	-9999.
046000	090	255	-65.5	.1473+03	.2471+03	-9999.
046100	092	256	-65.4	.1466+03	.2457+03	-9999.
046200	093	256	-65.2	.1458+03	.2444+03	-9999.
046300	095	258	-65.1	.1451+03	.2430+03	-9999.
046400	097	257	-65.0	.1444+03	.2416+03	-9999.
046500	100	258	-64.9	.1437+03	.2403+03	-9999.
046600	102	258	-64.7	.1430+03	.2389+03	-9999.
046700	103	258	-64.6	.1423+03	.2376+03	-9999.
046800	101	258	-64.5	.1415+03	.2363+03	-9999.
046900	100	259	-64.3	.1408+03	.2350+03	-9999.
047000	099	261	-64.2	.1401+03	.2337+03	-9999.
047100	097	261	-64.2	.1395+03	.2326+03	-9999.
047200	097	264	-64.3	.1388+03	.2315+03	-9999.
047300	095	265	-64.3	.1381+03	.2304+03	-9999.
047400	094	267	-64.4	.1374+03	.2293+03	-9999.
047500	092	267	-64.4	.1367+03	.2282+03	-9999.
047600	091	267	-64.5	.1360+03	.2271+03	-9999.
047700	090	267	-64.5	.1354+03	.2261+03	-9999.
047800	089	268	-64.6	.1347+03	.2250+03	-9999.
047900	088	268	-64.6	.1340+03	.2239+03	-9999.
048000	089	269	-64.7	.1334+03	.2229+03	-9999.
048100	089	267	-64.8	.1327+03	.2219+03	-9999.
048200	090	266	-64.9	.1321+03	.2209+03	-9999.
048300	091	267	-65.0	.1314+03	.2199+03	-9999.
048400	086	266	-65.1	.1307+03	.2189+03	-9999.
048500	085	270	-65.2	.1301+03	.2179+03	-9999.
048600	085	268	-65.3	.1294+03	.2170+03	-9999.
048700	082	267	-65.4	.1288+03	.2160+03	-9999.
048800	081	270	-65.5	.1282+03	.2150+03	-9999.
048900	083	269	-65.6	.1275+03	.2141+03	-9999.
049000	084	267	-65.7	.1269+03	.2131+03	-9999.
049100	087	265	-65.9	.1263+03	.2122+03	-9999.
049200	089	266	-66.0	.1256+03	.2113+03	-9999.
049300	091	264	-66.2	.1250+03	.2104+03	-9999.
049400	092	262	-66.3	.1244+03	.2095+03	-9999.
049500	094	261	-66.5	.1238+03	.2086+03	-9999.
049600	095	260	-66.7	.1231+03	.2078+03	-9999.
049700	093	262	-66.8	.1225+03	.2069+03	-9999.
049800	090	263	-67.0	.1219+03	.2060+03	-9999.
049900	087	266	-67.1	.1213+03	.2051+03	-9999.



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TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
050000	083	267	-67.3	.1207+03	.2043+03	-9999.
050100	081	269	-67.5	.1201+03	.2035+03	-9999.
050200	079	269	-67.8	.1195+03	.2027+03	-9999.
050300	076	271	-68.0	.1189+03	.2019+03	-9999.
050400	073	272	-68.2	.1183+03	.2011+03	-9999.
050500	067	273	-68.4	.1177+03	.2003+03	-9999.
05-600	067	275	-68.7	.1171+03	.1995+03	-9999.
0 .00	065	274	-68.9	.1165+03	.1987+03	-9999.
050800	061	274	-69.1	.1159+03	.1979+03	-9999.
050900	059	270	-69.4	.1153+03	.1972+03	-9999.
051000	057	271	-69.6	.1147+03	.1964+03	-9999.
051100	057	271	-69.9	.1142+03	.1956+03	-9999.
051200	056	269	-70.1	.1136+03	.1949+03	-9999.
051300	055	269	-70.4	.1130+03	.1942+03	-9999.
051400	053	268	-70.7	.1124+03	.1934+03	-9999.
051500	055	263	-70.9	.1119+03	.1927+03	-9999.
051600	055	262	-71.2	.1113+03	.1920+03	-9999.
051700	055	262	-71.5	.1107+03	.1913+03	-9999.
051800	057	259	-71.8	.1102+03	.1905+03	-9999.
051900	057	258	-72.0	.1096+03	.1898+03	-9999.
052000	058	255	-72.3	.1090+03	.1891+03	-9999.
052100	059	255	-72.5	.1085+03	.1883+03	-9999.
052200	060	252	-72.7	.1079+03	.1875+03	-9999.
052300	059	255	-72.8	.1074+03	.1867+03	-9999.
052400	061	247	-73.0	.1068+03	.1859+03	-9999.
052500	060	254	-73.2	.1062+03	.1851+03	-9999.
052600	064	249	-73.4	.1057+03	.1843+03	-9999.
052700	063	249	-73.6	.1052+03	.1835+03	-9999.
052800	063	249	-73.7	.1046+03	.1828+03	-9999.
052900	063	252	-73.9	.1041+03	.1820+03	-9999.
053000	066	249	-74.1	.1035+03	.1812+03	-9999.
053100	066	249	-73.9	.1030+03	.1801+03	-9999.
053200	066	253	-73.7	.1025+03	.1790+03	-9999.
053300	068	251	-73.5	.1019+03	.1779+03	-9999.
053400	071	247	-73.3	.1014+03	.1768+03	-9999.
053500	073	248	-73.1	.1009+03	.1757+03	-9999.
053600	074	250	-72.8	.1004+03	.1746+03	-9999.
053700	075	256	-72.6	.9986+02	.1735+03	-9999.
053800	076	256	-72.4	.9935+02	.1724+03	-9999.
053900	074	258	-72.2	.9884+02	.1714+03	-9999.
054000	074	260	-72.0	.9833+02	.1703+03	-9999.
054100	073	261	-71.9	.9783+02	.1693+03	-9999.
054200	071	261	-71.8	.9733+02	.1684+03	-9999.
054300	068	264	-71.7	.9683+02	.1674+03	-9999.
054400	064	262	-71.6	.9634+02	.1665+03	-9999.
054500	066	262	-71.5	.9584+02	.1656+03	-9999.
054600	064	262	-71.4	.9535+02	.1647+03	-9999.
054700	060	267	-71.3	.9487+02	.1637+03	-9999.
054800	056	268	-71.2	.9438+02	.1628+03	-9999.
054900	055	268	-71.1	.9390+02	.1619+03	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M <sup>3</sup> )	DEW POINT (DEG C)
055000	051	265	-71.0	.9342+02	.1610+03	-9999.
056000	056	259	-71.9	.8875+02	.1538+03	-9999.
057000	045	264	-72.8	.8430+02	.1466+03	-9999.
058000	040	268	-71.9	.8007+02	.1386+03	-9999.
059000	033	267	-70.7	.7607+02	.1309+03	-9999.
060000	025	258	-69.9	.7229+02	.1239+03	-9999.
061000	020	242	-69.7	.6871+02	.1171+03	-9999.
062000	018	221	-70.2	.6531+02	.1121+03	-9999.
063000	018	213	-69.9	.6207+02	.1064+03	-9999.
064000	018	226	-69.6	.5899+02	.1010+03	-9999.
065000	016	250	-70.1	.5607+02	.9620+02	-9999.
066000	015	276	-69.1	.5330+02	.9100+02	-9999.
067000	013	302	-66.4	.5068+02	.8539+02	-9999.
068000	009	326	-65.6	.4822+02	.8094+02	-9999.
069000	006	345	-65.6	.4588+02	.7701+02	-9999.
070000	005	004	-65.5	.4365+02	.7323+02	-9999.
071000	006	022	-65.0	.4154+02	.6952+02	-9999.
072000	009	043	-64.1	.3953+02	.6587+02	-9999.
073000	012	077	-63.4	.3763+02	.6250+02	-9999.
074000	015	111	-61.0	.3584+02	.5885+02	-9999.
075000	016	138	-60.1	.3414+02	.5582+02	-9999.
076000	016	154	-59.4	.3253+02	.5302+02	-9999.
077000	014	161	-58.1	.3100+02	.5022+02	-9999.
078000	011	157	-58.7	.2954+02	.4799+02	-9999.
079000	010	148	-58.5	.2816+02	.4570+02	-9999.
080000	011	143	-57.9	.2684+02	.4344+02	-9999.
081000	011	140	-57.3	.2559+02	.4130+02	-9999.
082000	012	166	-57.4	.2439+02	.3938+02	-9999.
083000	013	188	-57.0	.2325+02	.3747+02	-9999.
084000	016	211	-56.2	.2217	.3565+02	-9999.
085000	020	233	-55.1	.2115	.3379+02	-9999.
086000	023	244	-53.6	.2017+1	.3200+02	-9999.
087000	025	250	-52.1	.1925+02	.3034+02	-9999.
088000	024	253	-50.7	.1838+02	.2878+02	-9999.
089000	021	251	-50.3	.1755+02	.2743+02	-9999.
090000	018	248	-50.2	.1675+02	.2617+02	-9999.
091000	015	236	-50.5	.1600+02	.2503+02	-9999.
092000	014	225	-50.4	.1527+02	.2388+02	-9999.
093000	014	220	-49.6	.1458+02	.2272+02	-9999.
094000	016	231	-48.4	.1393+02	.2159+02	-9999.
095000	019	241	-47.2	.1331+02	.2052+02	-9999.
096000	023	252	-46.1	.1272+02	.1952+02	-9999.
097000	027	250	-45.2	.1215+02	.1857+02	-9999.
098000	029	263	-44.1	.1166+02	.1773+02	-9999.
099000	025	265	-42.0	.1120+02	.1688+02	-9999.
100000	024	262	-40.3	.1075+02	.1609+02	-9999.
101000	032	268	-38.6	.1029+02	.1528+02	-9999.
102000	030	277	-37.2	.9852+01	.1454+02	-9999.
103000	025	280	-36.7	.9432+01	.1390+02	-9999.
104000	021	277	-35.5	.9031+01	.1324+02	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
105000	018	266	-33.9	.8650+01	.1259+02	-9999.
106000	021	255	-33.3	.8286+01	.1203+02	-9999.
107000	025	249	-33.1	.7938+01	.1152+02	-9999.
108000	028	248	-33.1	.7605+01	.1104+02	-9999.
109000	033	246	-32.5	.7287+01	.1055+02	-9999.
110000	037	242	-31.0	.6983+01	.1005+02	-9999.
111000	038	240	-29.4	.6694+01	.9567+01	-9999.
112000	040	244	-28.3	.6418+01	.9131+01	-9999.
113000	042	249	-27.5	.6154+01	.8729+01	-9999.
114000	043	251	-26.8	.5902+01	.8348+01	-9999.
115000	042	254	-26.2	.5651+01	.7986+01	-9999.
116000	045	259	-25.5	.5431+01	.7641+01	-9999.
117000	045	265	-24.8	.5211+01	.7310+01	-9999.
118000	037	274	-22.4	.5000+01	.6947+01	-9999.
119000	030	271	-19.5	.4801+01	.6592+01	-9999.
120000	025	257	-19.2	.4610+01	.6324+01	-9999.
121000	023	270	-17.9	.4428+01	.6044+01	-9999.
122000	023	293	-16.4	.4254+01	.5771+01	-9999.
123000	023	307	-14.9	.4088+01	.5513+01	-9999.
124000	020	307	-14.1	.3928+01	.5282+01	-9999.
125000	018	282	-14.8	.3776+01	.5090+01	-9999.
126000	018	274	-15.8	.3628+01	.4912+01	-9999.
127000	021	282	-16.7	.3486+01	.4735+01	-9999.
128000	027	283	-16.5	.3349+01	.4547+01	-9999.
129000	032	242	-15.9	.3217+01	.4358+01	-9999.
130000	032	282	-15.2	.3093+01	.4176+01	-9999.
131000	028	277	-14.5	.2972+01	.4003+01	-9999.
132000	023	263	-13.9	.2857+01	.3838+01	-9999.
133000	020	236	-13.2	.2746+01	.3680+01	-9999.
134000	020	221	-12.8	.2640+01	.3532+01	-9999.
135000	016	220	-13.2	.2538+01	.3401+01	-9999.
136000	015	224	-14.3	.2439+01	.3283+01	-9999.
137000	015	224	-15.5	.2344+01	.3170+01	-9999.
138000	016	239	-16.7	.2252+01	.3060+01	-9999.
139000	020	251	-17.7	.2164+01	.2951+01	-9999.
140000	021	258	-17.2	.2079+01	.2830+01	-9999.
141000	021	262	-15.5	.1998+01	.2701+01	-9999.
142000	023	272	-14.2	.1920+01	.2583+01	-9999.
143000	021	282	-13.5	.1846+01	.2476+01	-9999.
144000	023	285	-12.9	.1774+01	.2375+01	-9999.
145000	027	282	-12.4	.1706+01	.2279+01	-9999.
146000	033	278	-11.8	.1640+01	.2186+01	-9999.
147000	037	267	-11.4	.1577+01	.2098+01	-9999.
148000	047	285	-10.8	.1516+01	.2014+01	-9999.
149000	040	299	-10.3	.1458+01	.1933+01	-9999.
150000	030	266	-9.8	.1403+01	.1856+01	-9999.
151000	027	288	-9.3	.1349+01	.1782+01	-9999.
152000	016	275	-8.9	.1298+01	.1711+01	-9999.
153000	027	208	-8.4	.1249+01	.1643+01	-9999.
154000	045	198	-7.9	.1201+01	.1578+01	-9999.

TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
155000	052	193	-8.6	.1156+01	.1522+01	-9999.
156000	065	196	-9.5	.1112+01	.1469+01	-9999.
157000	065	202	-10.3	.1069+01	.1418+01	-9999.
158000	055	216	-11.3	.1029+01	.1368+01	-9999.
159000	052	223	-12.1	.9890+00	.1320+01	-9999.
160000	050	222	-12.9	.9510+00	.1273+01	-9999.
161000	060	215	-13.9	.9142+00	.1228+01	-9999.
162000	062	223	-13.8	.8788+00	.1181+01	-9999.
163000	064	245	-12.8	.8449+00	.1131+01	-9999.
164000	059	249	-11.9	.8124+00	.1083+01	-9999.
165000	060	248	-11.1	.7812+00	.1038+01	-9999.
166000	069	258	-10.2	.7514+00	.9955+00	-9999.
167000	064	268	-9.4	.7228+00	.9546+00	-9999.
168000	060	285	-9.0	.6953+00	.9171+00	-9999.
169000	048	295	-9.0	.6689+00	.8823+00	-9999.
170000	037	280	-9.1	.6435+00	.8489+00	-9999.
171000	030	262	-9.0	.6191+00	.8166+00	-9999.
172000	033	250	-9.2	.5956+00	.7859+00	-9999.
173000	045	230	-10.3	.5729+00	.7593+00	-9999.
174000	059	220	-11.9	.5510+00	.7347+00	-9999.
175000	070	219	-13.0	.5298+00	.7095+00	-9999.
176000	070	223	-13.0	.5094+00	.6821+00	-9999.
177000	055	234	-13.0	.4898+00	.6559+00	-9999.
178000	050	251	-12.9	.4709+00	.6304+00	-9999.
179000	052	258	-12.9	.4528+00	.6062+00	-9999.
180000	045	267	-13.2	.4353+00	.5834+00	-9999.
181000	025	293	-13.8	.4185+00	.5621+00	-9999.
182000	008	315	-14.3	.4024+00	.5415+00	-9999.
183000	006	137	-18.9	.3868+00	.5217+00	-9999.
184000	023	165	-15.3	.3718+00	.5024+00	-9999.
185000	037	199	-15.9	.3573+00	.4838+00	-9999.
186000	055	217	-16.4	.3434+00	.4660+00	-9999.
187000	062	228	-16.9	.3300+00	.4487+00	-9999.
188000	064	241	-17.5	.3171+00	.4321+00	-9999.
189000	054	251	-18.0	.3047+00	.4160+00	-9999.
190000	050	249	-18.4	.2927+00	.4003+00	-9999.
191000	045	237	-19.1	.2812+00	.3856+00	-9999.
192000	059	219	-19.4	.2701+00	.3709+00	-9999.
193000	069	213	-20.0	.2595+00	.3571+00	-9999.
194000	077	213	-20.6	.2492+00	.3437+00	-9999.
195000	077	216	-21.0	.2394+00	.3307+00	-9999.
196000	062	225	-21.4	.2299+00	.3181+00	-9999.
197000	043	241	-22.2	.2207+00	.3063+00	-9999.
198000	030	253	-22.5	.2119+00	.2945+00	-9999.
199000	010	270	-23.0	.2035+00	.2834+00	-9999.
200000	010	266	-24.0	.1957+00	.2725+00	-9999.
201000	011	263	-25.0	.1881+00	.2621+00	-9999.
202000	011	260	-26.0	.1809+00	.2520+00	-9999.
203000	012	258	-27.0	.1740+00	.2423+00	-9999.
204000	012	255	-28.0	.1673+00	.2330+00	-9999.

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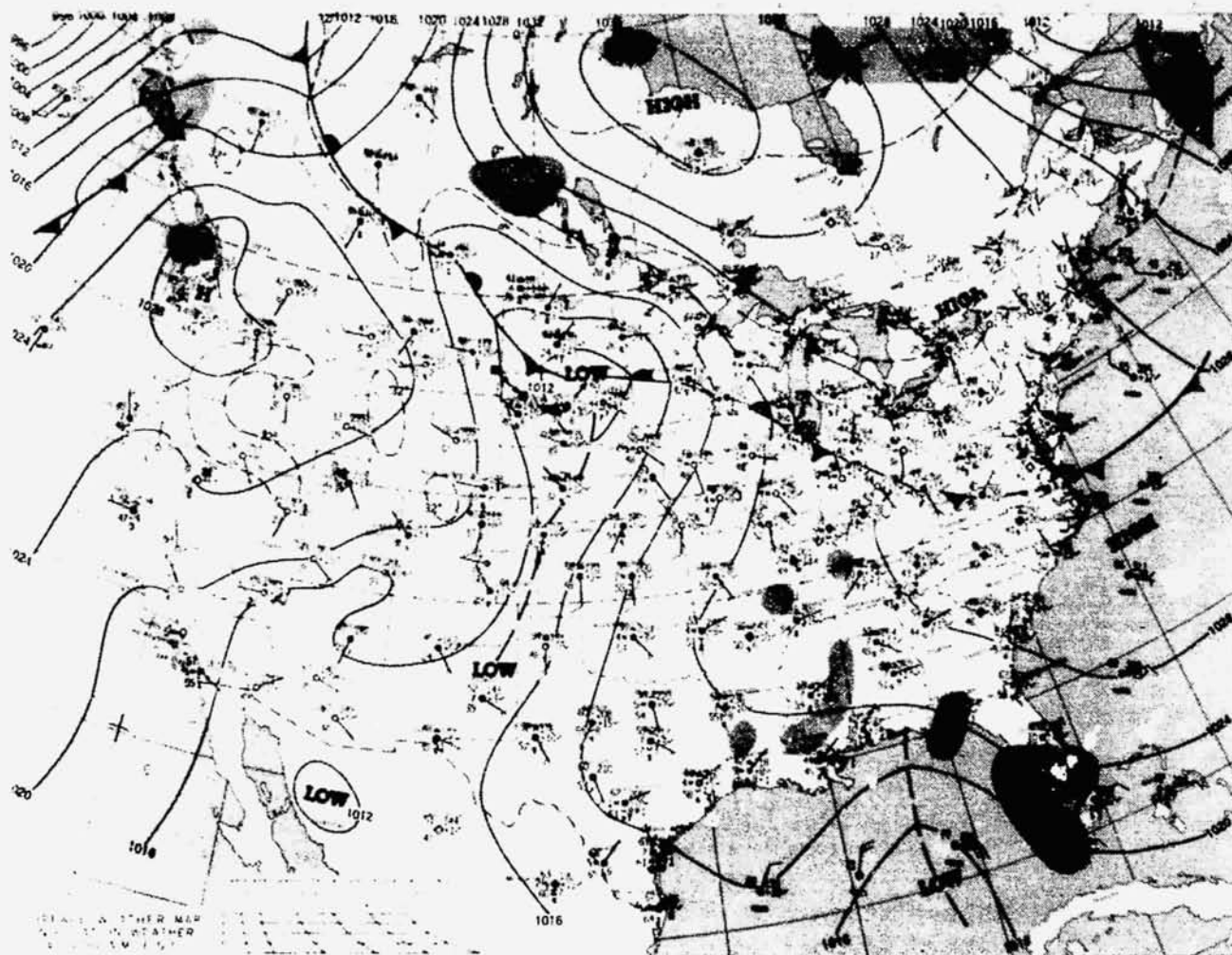
TABLE 5. (Continued)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
205000	013	253	-29.0	.1608+00	.2240+00	-9999.
206000	013	251	-30.0	.1546+00	.2154+00	-9999.
207000	014	249	-31.0	.1487+00	.2071+00	-9999.
208000	014	247	-32.0	.1430+00	.1991+00	-9999.
209000	015	246	-33.0	.1375+00	.1915+00	-9999.
210000	016	244	-34.0	.1322+00	.1841+00	-9999.
211000	016	243	-35.0	.1271+00	.1770+00	-9999.
212000	017	242	-35.9	.1222+00	.1702+00	-9999.
213000	017	241	-36.9	.1175+00	.1637+00	-9999.
214000	018	239	-37.9	.1130+00	.1574+00	-9999.
217000	018	247	-40.3	.9880-01	.1480+00	-9999.
220000	019	254	-42.6	.8650-01	.1310+00	-9999.
223000	019	261	-44.9	.7570-01	.1160+00	-9999.
226000	020	268	-47.5	.6630-01	.1030+00	-9999.
229000	021	273	-50.1	.5800-01	.9080-01	-9999.
232000	018	280	-52.2	.5040-01	.7970-01	-9999.
235000	015	291	-54.3	.4370-01	.6980-01	-9999.
238000	012	308	-56.3	.3790-01	.6110-01	-9999.
241000	010	331	-58.4	.3290-01	.5350-01	-9999.
244000	011	355	-60.5	.2850-01	.4690-01	-9999.
247000	013	012	-62.4	.2470-01	.4100-01	-9999.
250000	015	021	-64.1	.2140-01	.3570-01	-9999.
253000	016	029	-65.6	.1850-01	.3100-01	-9999.
256000	018	035	-67.1	.1590-01	.2700-01	-9999.
259000	021	040	-68.7	.1380-01	.2350-01	-9999.
262000	023	044	-70.2	.1190-01	.2040-01	-9999.
265000	020	060	-71.3	.1020-01	.1760-01	-9999.
268000	020	083	-72.3	.8770-02	.1520-01	-9999.
271000	022	104	-73.2	.7530-02	.1310-01	-9999.
274000	026	120	-74.2	.6460-02	.1130-01	-9999.
277000	032	131	-75.2	.5540-02	.9740-02	-9999.
280000	035	132	-76.2	.4760-02	.8400-02	-9999.
283000	031	121	-77.3	.4080-02	.7240-02	-9999.
286000	028	108	-78.5	.3500-02	.6240-02	-9999.
289000	027	094	-79.6	.3000-02	.5380-02	-9999.
292000	029	079	-80.8	.2570-02	.4640-02	-9999.
295000	031	066	-81.9	.2200-02	.4000-02	-9999.
298000	024	063	-82.9	.1830-02	.3330-02	-9999.
301000	014	052	-83.3	.1550-02	.2830-02	-9999.
304000	006	333	-83.6	.1310-02	.2400-02	-9999.
307000	022	279	-84.0	.1110-02	.2030-02	-9999.
310000	048	271	-84.4	.9450-03	.1730-02	-9999.
313000	067	269	-84.1	.8030-03	.1460-02	-9999.
316000	067	269	-82.9	.6820-03	.1230-02	-9999.
319000	065	269	-81.8	.5800-03	.1030-02	-9999.
322000	059	269	-81.1	.4930-03	.8710-03	-9999.
325000	050	268	-79.6	.4190-03	.7340-03	-9999.
328000	035	266	-78.5	.3560-03	.6180-03	-9999.
331000	038	267	-75.1	.3050-03	.5190-03	-9999.
334000	042	265	-71.7	.2610-03	.4350-03	-9999.

TABLE 5. (Concluded)

ALTITUDE (FT)	WIND SPEED (FT/SEC)	WIND DIRECTION (DEG)	TEMPERATURE (DEG C)	PRESSURE (MILLIBARS)	DENSITY (GRAM/M3)	DEW POINT (DEG C)
337000	046	264	-68.3	.2230-03	.3650-03	-9999.
340000	050	262	-66.9	.1910-03	.3070-03	-9999.
343000	053	260	-61.5	.1630-03	.2570-03	-9999.
346000	055	263	-57.0	.1410-03	.2170-03	-9999.
349000	056	261	-51.4	.1240-03	.1850-03	-9999.
352000	056	257	-45.9	.1080-03	.1570-03	-9999.
355000	054	252	-40.3	.9490-04	.1340-03	-9999.
358000	051	245	-34.8	.8250-04	.1140-03	-9999.
361000	040	249	-29.2	.7200-04	.9670-04	-9999.
364000	041	243	-21.8	.6460-04	.8390-04	-9999.
367000	043	235	-14.5	.5790-04	.7280-04	-9999.
370000	045	225	-7.4	.5170-04	.6310-04	-9999.
373000	049	214	.2	.4630-04	.5480-04	-9999.
376000	056	201	7.5	.4130-04	.4750-04	-9999.
379000	034	208	15.5	.3720-04	.4150-04	-9999.
382000	037	204	24.2	.3390-04	.3650-04	-9999.
385000	040	200	33.2	.3090-04	.3220-04	-9999.
388000	044	197	42.4	.2830-04	.2850-04	-9999.
391000	048	195	51.9	.2590-04	.2540-04	-9999.
394000	052	192	61.5	.2360-04	.2260-04	-9999.
397000	056	190	71.3	.2200-04	.2020-04	-9999.
400000	061	188	81.3	.2040-04	.1810-04	-9999.

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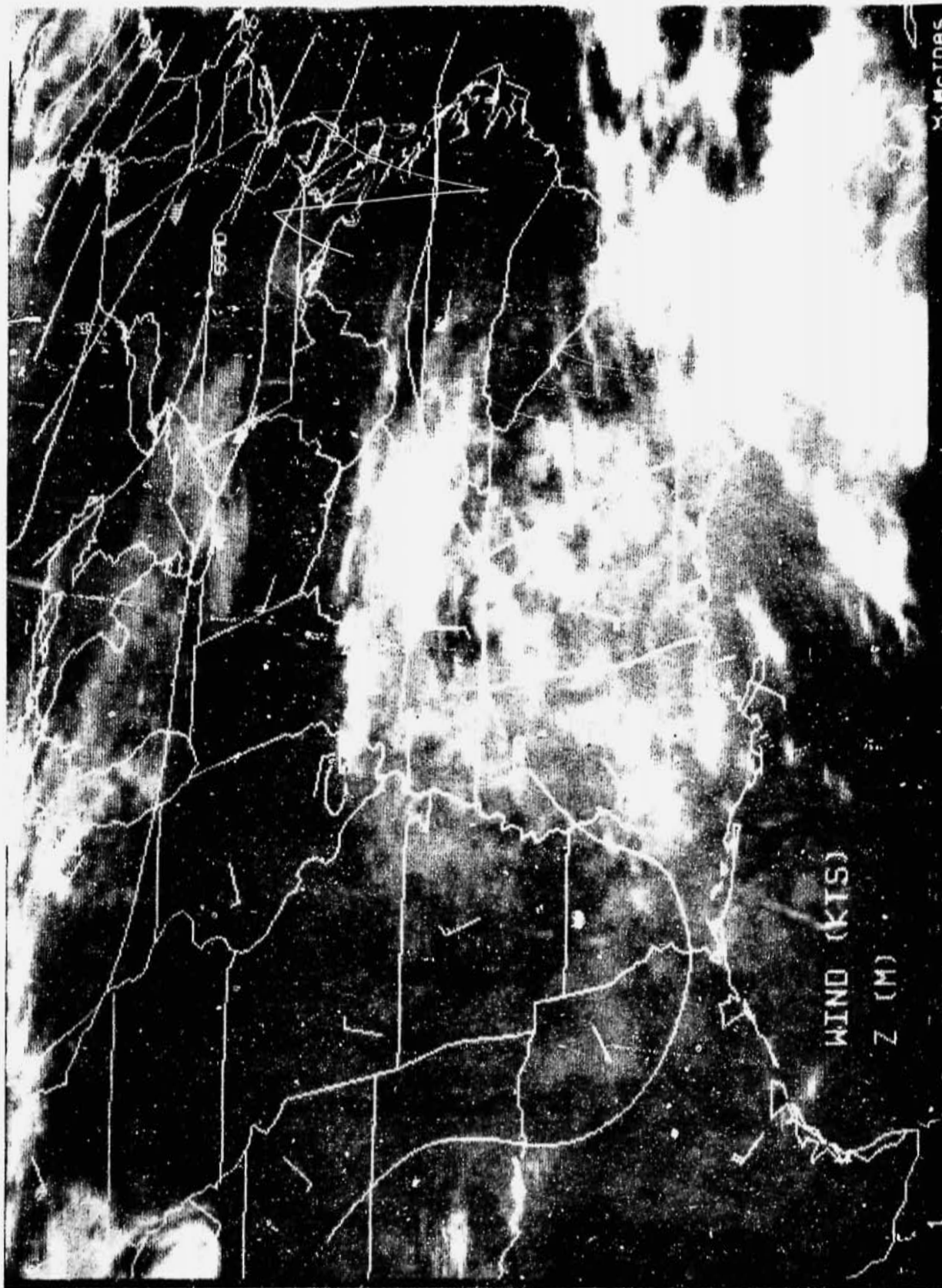


Figure 3. GOES-6 visible imagery of cloud cover 1 min after launch of STS-51D (1400 UT, April 12, 1985). 500-mb contours and wind barbs are also included for 1200 UT.

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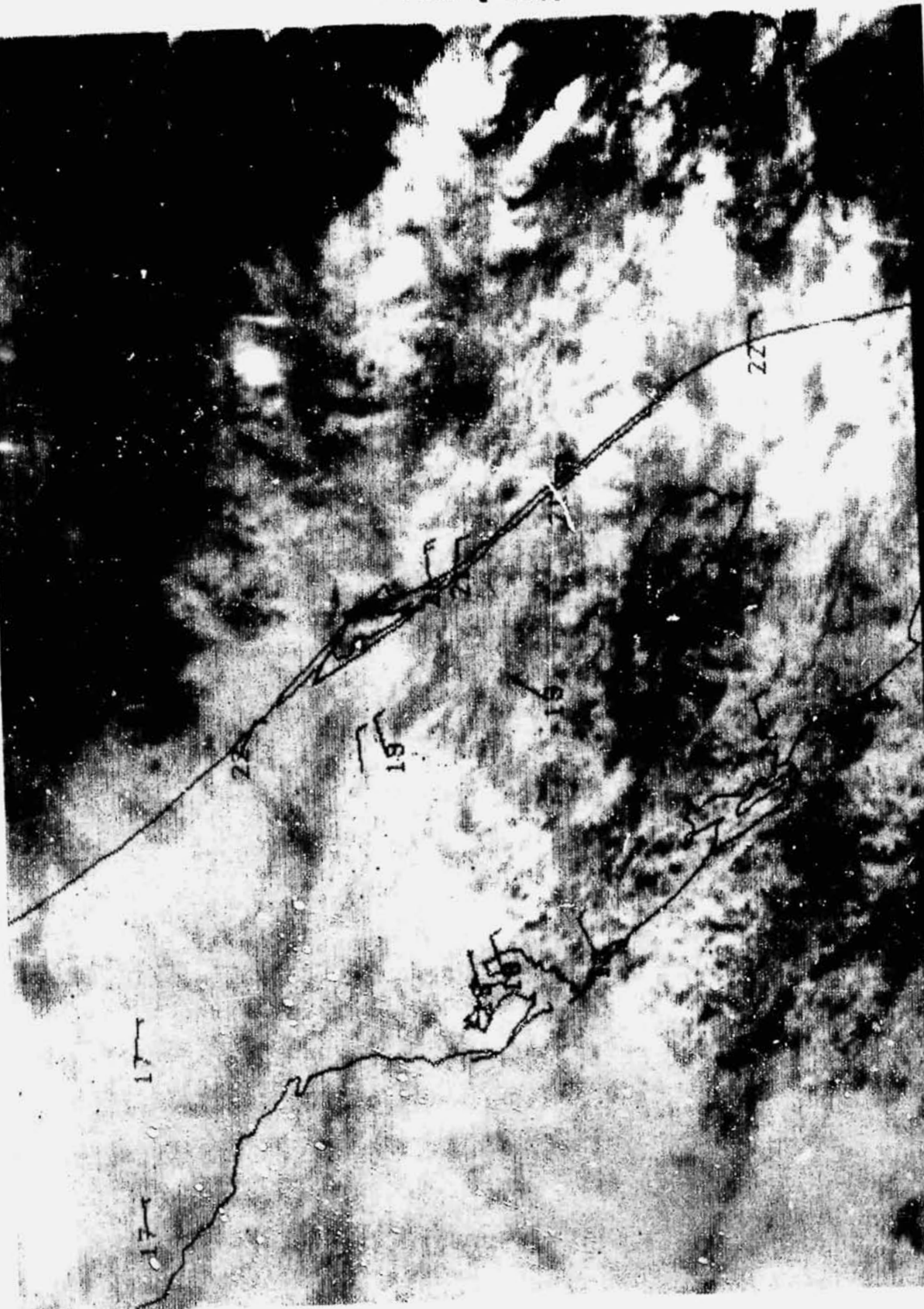


Figure 4. Enlarged view of GOES-6 visible imagery of cloud cover taken 1 min after launch of STS-51D (1400 UT, April 12, 1985). Surface temperatures and wind barbs for 1400 UT are also included).

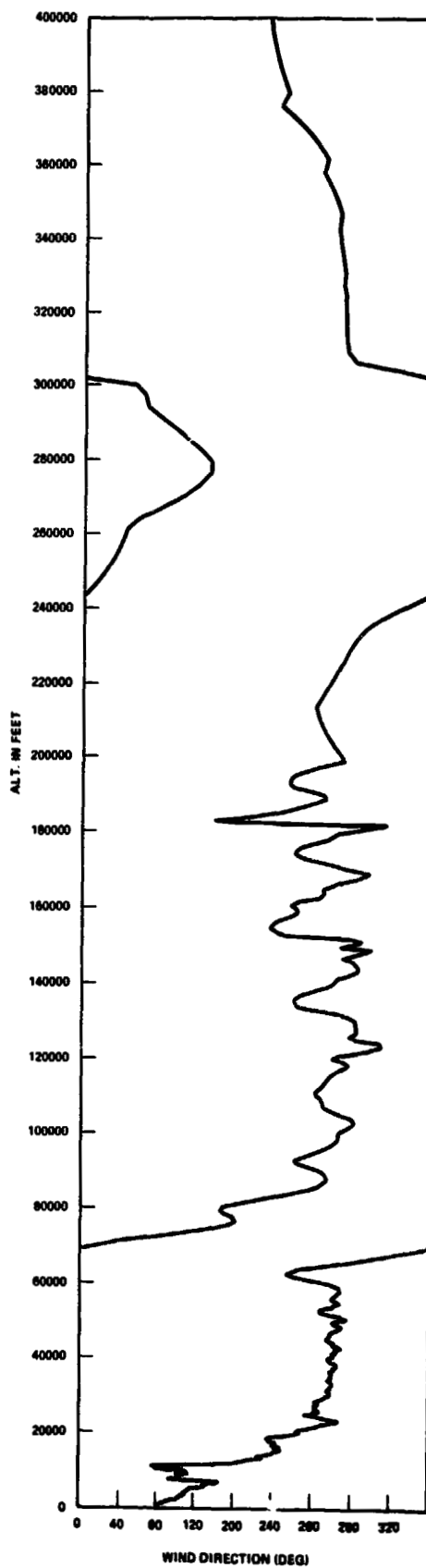
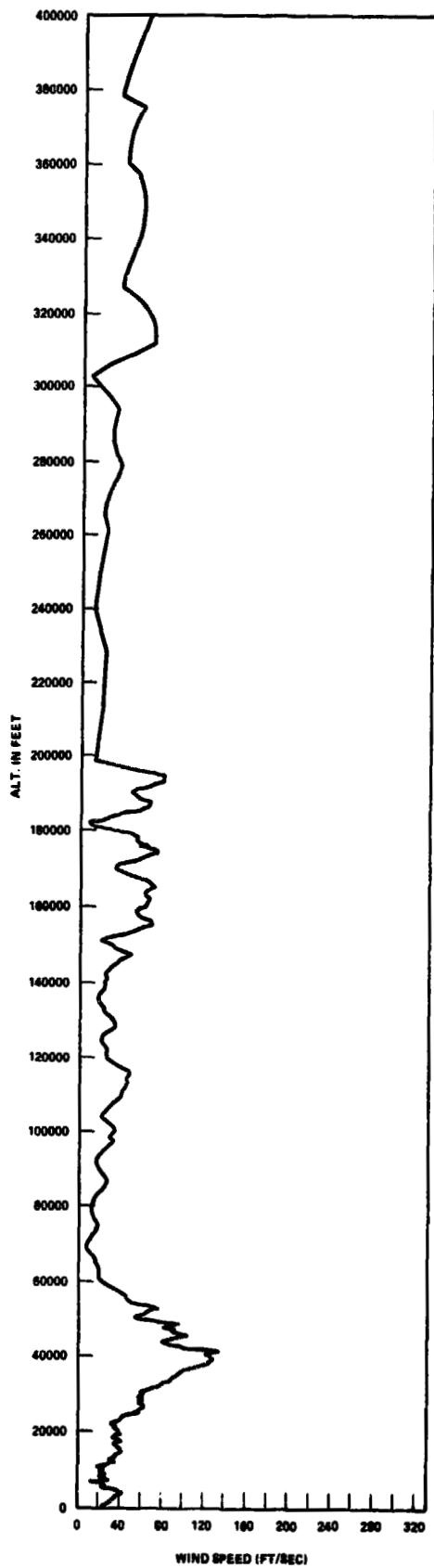


Figure 5. Scalar wind speed and direction at launch time of STS-51D.

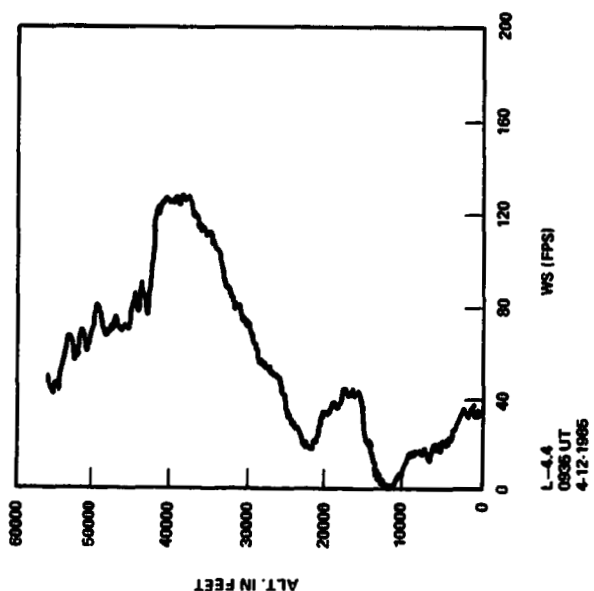
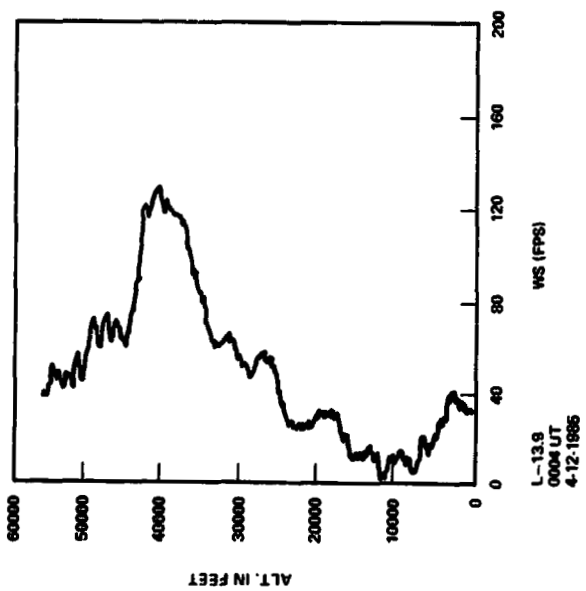
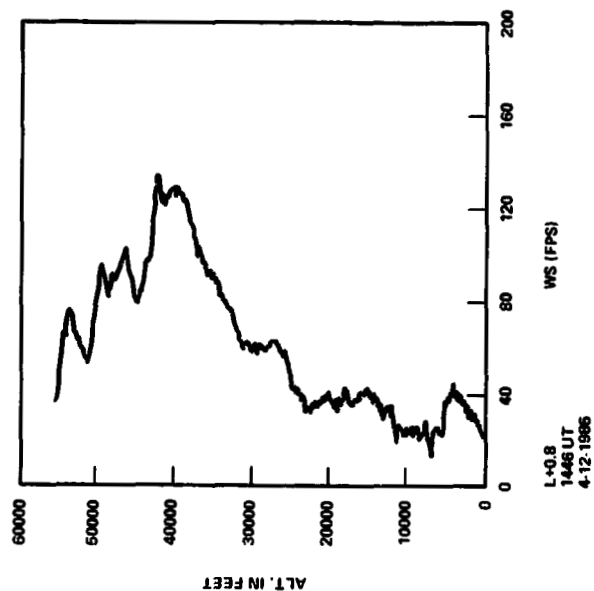
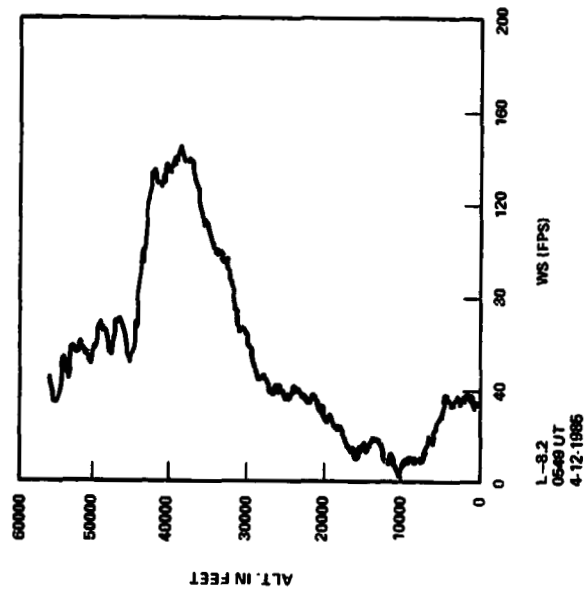


Figure 6. STS-51D prelaunch/launch Jimsphere-measured wind speeds (FPS).

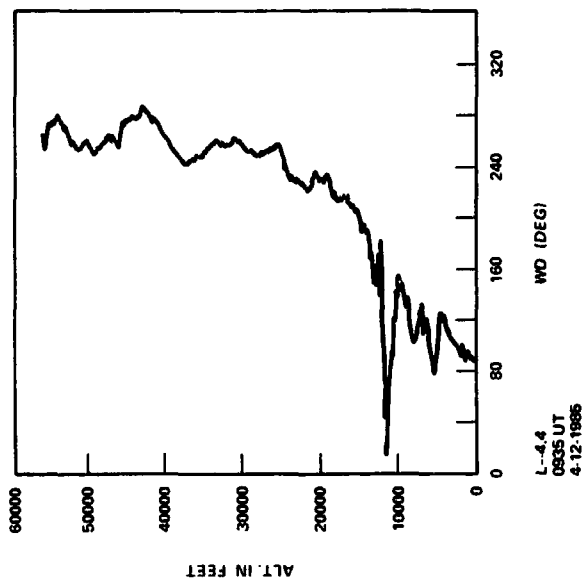
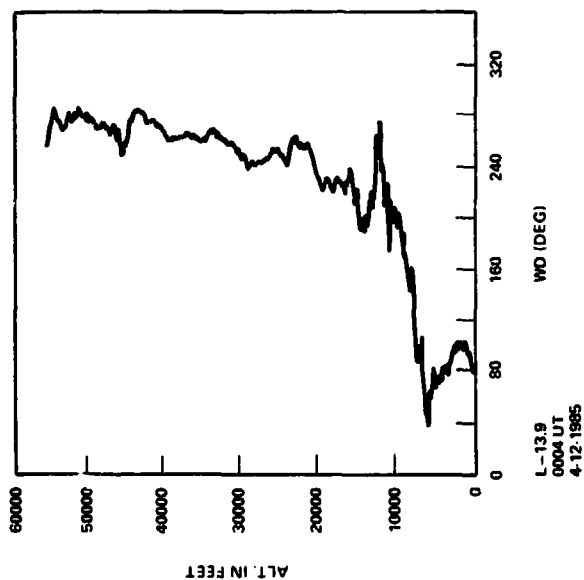
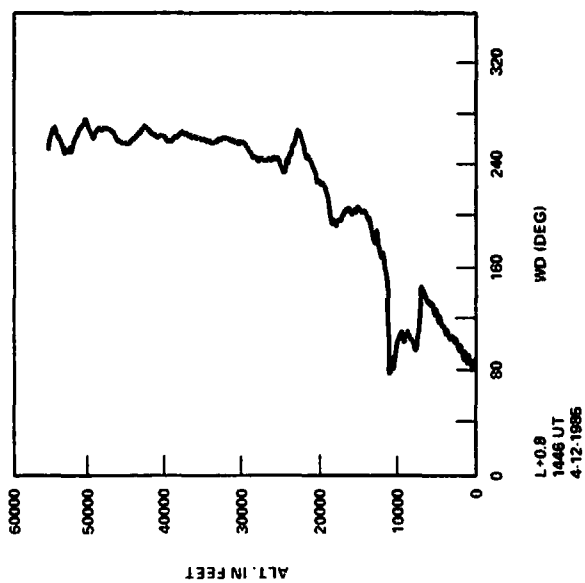
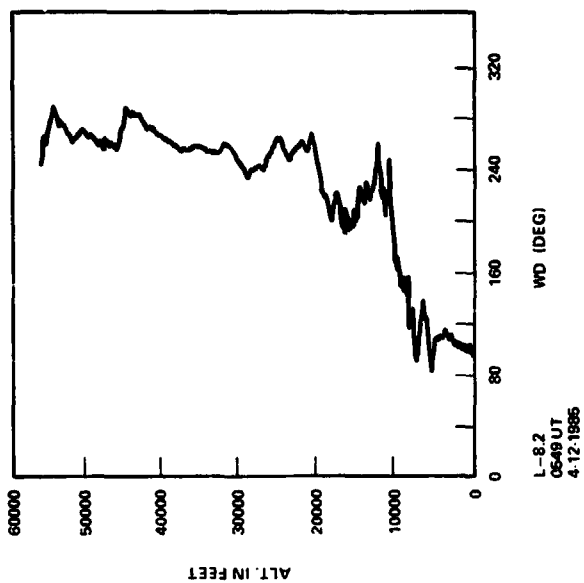


Figure 7. STS-51D prelaunch/launch Jimsphere-measured wind directions (degrees).

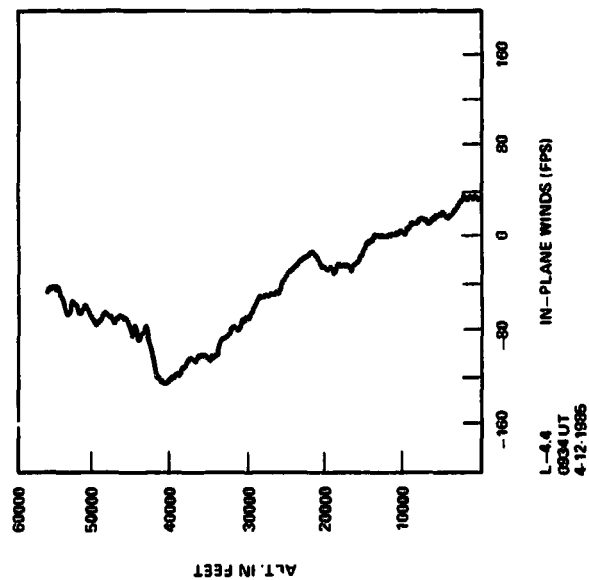
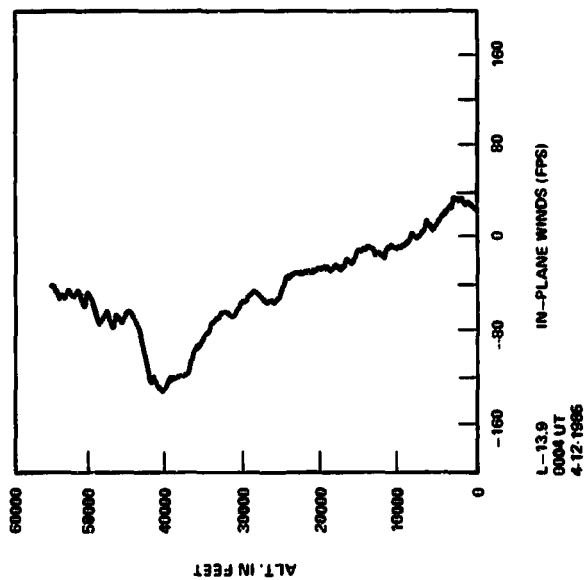
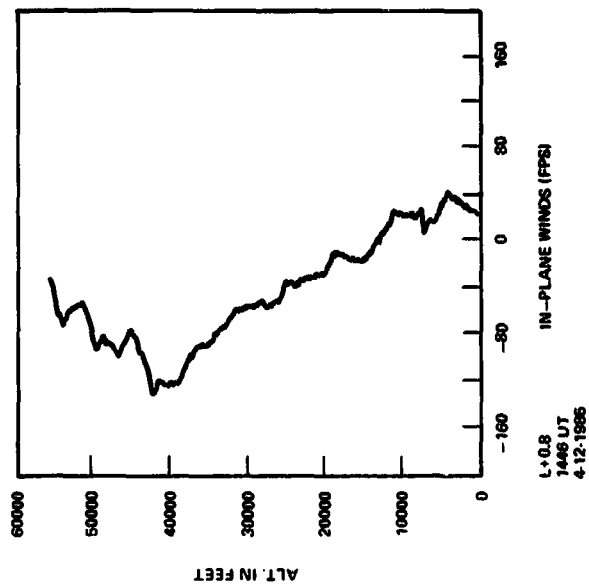
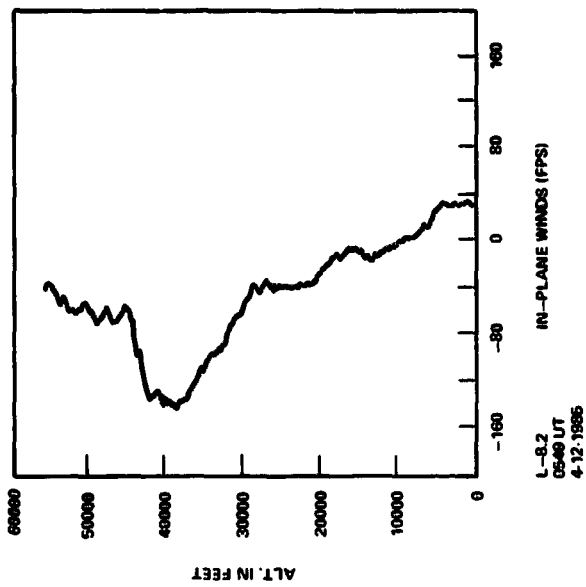


Figure 8. SFS-51D prelaunch/launch Jimsphere-measured in-plane component winds (FPS).  
Flight azimuth = 91.6 deg.

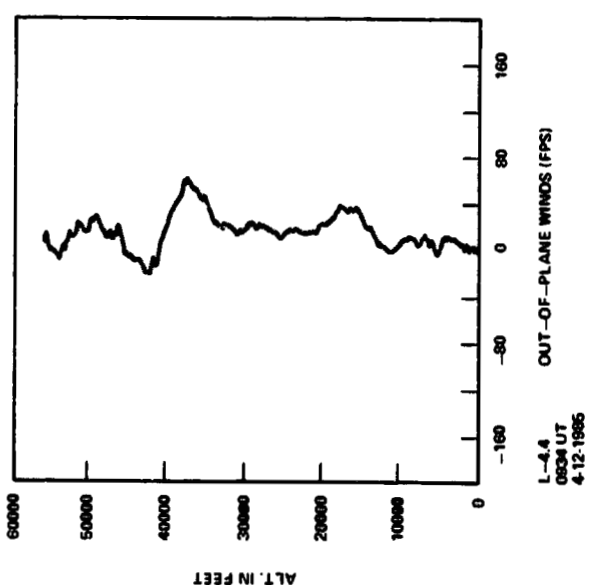
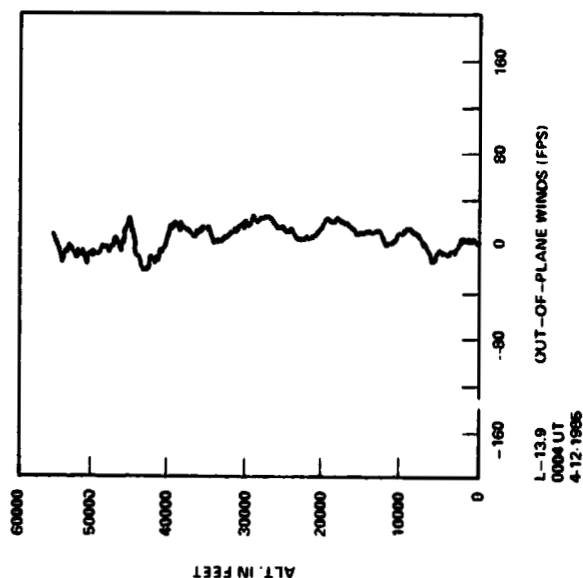
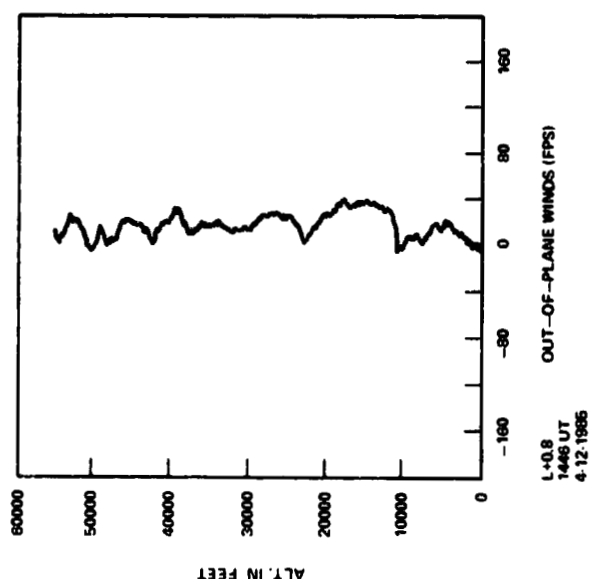
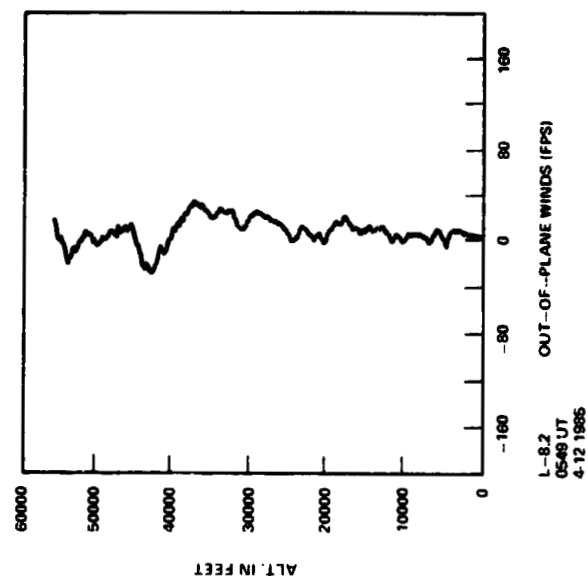


Figure 9. STS-51D prelaunch/launch Jimsphere-measured out-of-plane component winds (FPS).  
Flight azimuth = 91.6 deg.

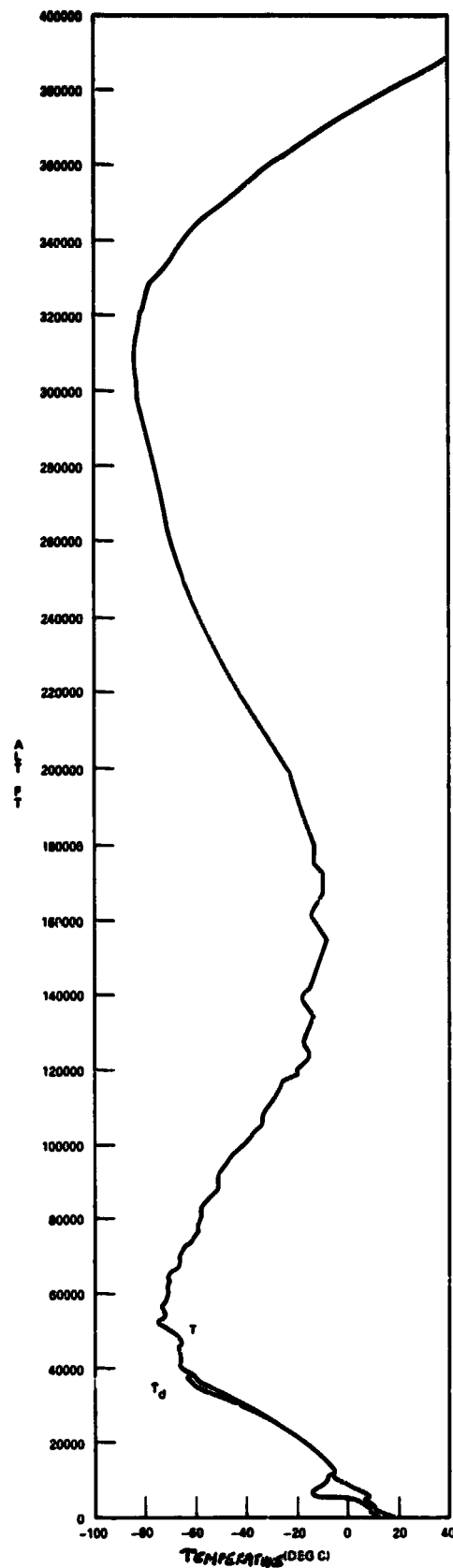


Figure 10. STS-51D temperature profiles versus altitude for launch (ascent).



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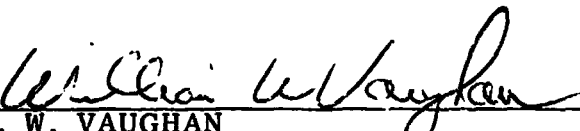
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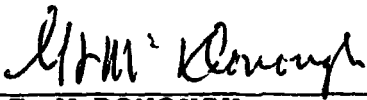
## APPROVAL

### ATMOSPHERIC ENVIRONMENT FOR SPACE SHUTTLE (STS-51D) LAUNCH

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The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

  
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